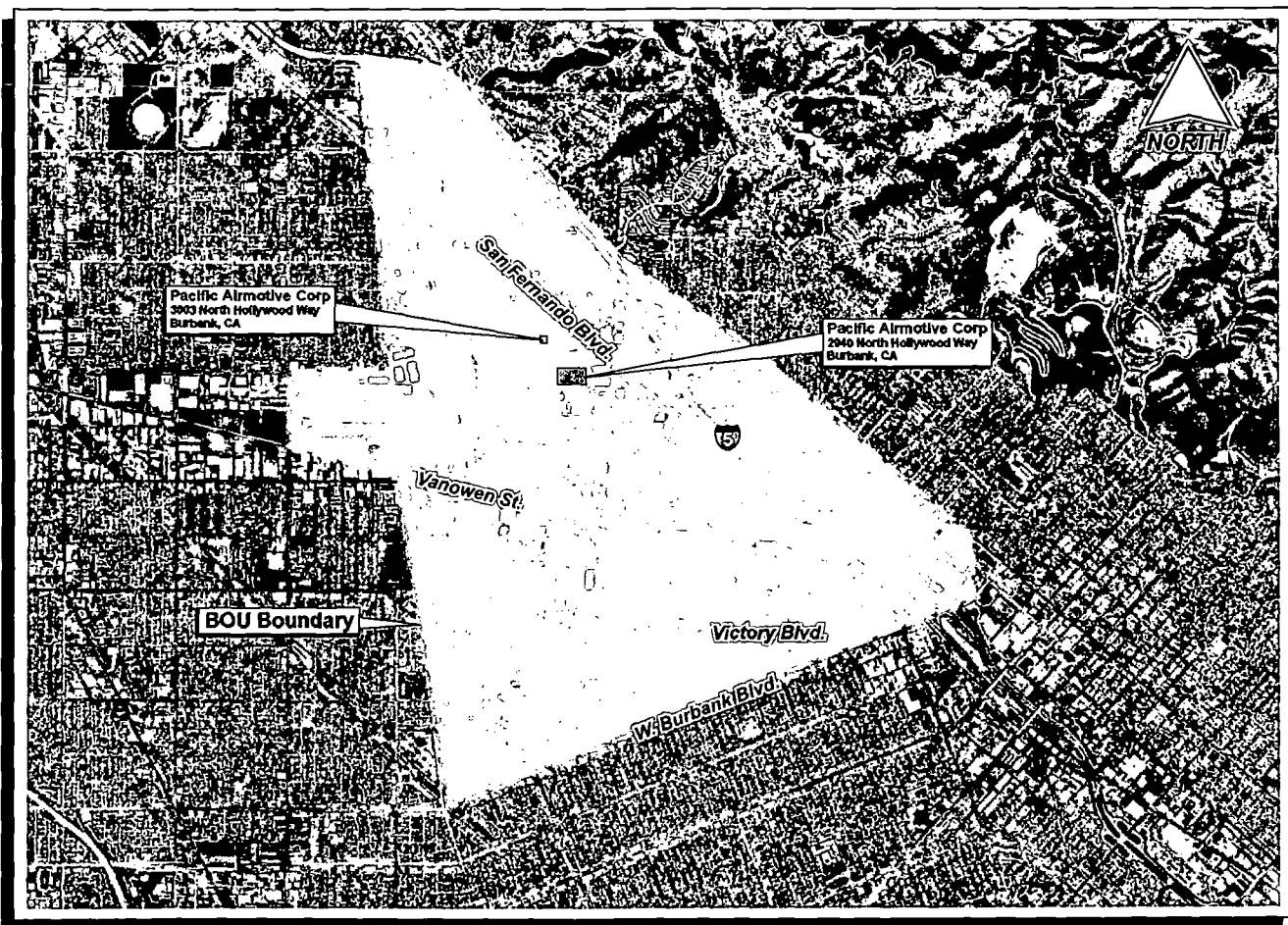


**FINAL
GROUNDWATER MONITORING REPORT
FIRST, SECOND, AND THIRD QUARTERS OF 2007
PACIFIC AIRMOTIVE CORPORATION
2940 AND 3003 NORTH HOLLYWOOD WAY
BURBANK, CALIFORNIA**



Prepared for:

LOCKHEED MARTIN

Prepared by:



Tetra Tech, Inc.
3475 E. Foothill Blvd.
Pasadena, California
TC# 20119 - December 2007



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December 31, 2007

Ms. Rachel Loftin
Remedial Project Manager
US. EPA, Pacific Southwest Region - 9th Floor
Superfund Division, SFD-7-4
75 Hawthorne Street
San Francisco, CA 94105

Dear Rachel:

Enclosed please find one (1) copy of the Groundwater Monitoring Report, First, Second and Third Quarters of 2007, Pacific Airmotive Corporation, 2940 and 3003 North Hollywood Way, Burbank, California. Please do not hesitate to contact me if you have any questions or comments.

Regards,

A handwritten signature in black ink, appearing to read 'Lisa A. Hamilton'.

Lisa A. Hamilton
Manager, MidAtlantic/Southeast/Western Regions

cc Linda Gertler, LMC (w/out enclosure)
Ken Martins, CH2M Hill (with enclosure)
Dixon Oriola, LARWQCB (with enclosure)
Alex Lapostol, E2 (with enclosure)
Susanne Herald, GE (w/out enclosure)

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December 2007

TC# 20119-01

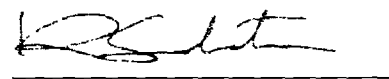
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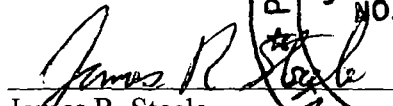
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Corporate Energy, Environmental Safety and Health
Burbank, CA

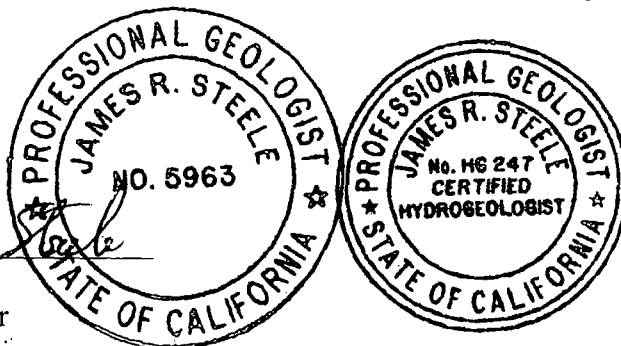
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1.0 INTRODUCTION

On behalf of Lockheed Martin Corporation (LMC), Tetra Tech, Inc. (Tetra Tech) has prepared this groundwater monitoring report for two Pacific Airmotive Corporation (PAC) properties within the Burbank Operable Unit (BOU) in Burbank, California (Figure 1-1). This report presents the results for groundwater sampling performed during the second quarter of 2007 (June) and for groundwater elevation monitoring recorded during the first (March), second (June), and third (September) quarters of 2007. LMC is performing work requested by the U.S. Environmental Protection Agency (EPA) in letters directed to General Electric (GE) dated October 20, 2005 (EPA 2005) and June 8, 2007 (EPA 2007), due to a settlement agreement between PAC, an indirect wholly-owned subsidiary of GE, and LMC.

In the October 20, 2005 letter, EPA requested GE to initiate four quarters of groundwater sampling at the eight existing wells within the PAC properties. This requirement was based on previous facility operations, detection of constituents, lack of current groundwater data, and recent regulatory concerns related to potential sources associated with emergent chemicals within the BOU. The EPA required analysis of the groundwater samples for volatile organic compounds (VOCs); 1,2,3-trichloropropane (1,2,3-TCP); Title 22 metals, including thallium and dissolved (total) chromium; hexavalent chromium; 1,4-dioxane; N-nitrosodimethylamine (NDMA); perchlorate; nitrate/nitrite; common cations and anions; dissolved oxygen; sulfide; and dissolved iron and manganese.

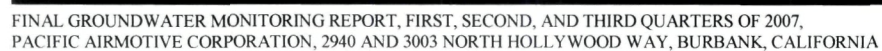
In the June 8, 2007 letter, EPA stated that based on review of the quarterly monitoring reports for 2006 and other historical data for the PAC site, the EPA revised the required analytical program for the June 2007 sampling event to include tetrachloroethene (PCE), trichloroethene (TCE), carbon tetrachloride, 1, 2-dichloroethane, 1,1-dichloroethene, 1,2,3-trichloropropane (TCP), total chromium, hexavalent chromium, 1,4-dioxane, nitrate, and thallium.

1.1 SITE LOCATION AND DESCRIPTION

The PAC properties are located at 2940 and 3003 North Hollywood Way within the north-central portion of the BOU (Figure 1-1). The property at 2940 North Hollywood Way was identified as the Main Facility, and the property at 3003 North Hollywood Way was identified as the Jet Engine Test Cell Facility. Both facilities were historically associated with the manufacturing, design, and repair of aircraft and aircraft engines. Structures on 2940 North Hollywood Way have been demolished and the property has been sold. Structures on 3003 North Hollywood Way are currently vacant.

1.2 OBJECTIVE

The purpose of this groundwater monitoring report is to comply with the provisions of the EPA October 20, 2005, and June 8, 2007 letters. The objective of this monitoring report is to present groundwater elevation data collected during the first, second, and third quarters of 2007, and groundwater quality monitoring results for samples collected during the second quarter of 2007. The groundwater data are being collected to assist EPA in assessing the current groundwater quality and conditions at the above mentioned monitoring wells and within the BOU. The quarterly groundwater monitoring report presents field data, laboratory analytical results, and quality control (QC) data collected during groundwater level measurement and water quality monitoring.



1.3 REPORT ORGANIZATION

The quarterly groundwater monitoring report has been organized into the following six sections:

- Section 1. Introduction: introduces the project and presents the objectives and report format.
- Section 2. Subsurface Conditions: presents the site geologic and hydrogeologic setting.
- Section 3. Description of Historical Areas of Concern: identifies the constituents of potential concern in groundwater underneath the PAC properties.
- Section 4. Groundwater Monitoring Procedures: summarizes the groundwater monitoring activities, groundwater measurements, and laboratory analysis conducted.
- Section 5. Groundwater Analytical Results: discusses groundwater monitoring results.
- Section 6. References: lists the references used to prepare this groundwater monitoring report.

2.0 SUBSURFACE CONDITIONS

2.1 GEOLOGY

The PAC properties are located in the southeastern portion of the San Fernando Valley (SFV) between the Santa Monica and Verdugo mountains. The SFV is located on the northwestern block of the Los Angeles Basin within the Transverse Ranges Geomorphic Province, an east-west trending unit composed of subparallel ranges separated by alluviated, synclinal valleys and prominent faults. The SFV is bordered to the north by the Santa Susana and San Gabriel mountains, to the east by the Verdugo Mountains, to the south by the Santa Monica Mountains, and to the west by the Simi Hills. These uplands are composed of crystalline bedrock that is Precambrian to Mesozoic in age and sedimentary units from Cretaceous to Pleistocene in age. The crystalline bedrock and sedimentary units were eroded from the uplands during the Quaternary Period and deposited as more than 2,000 feet of alluvium in the SFV. The only major structural feature near the PAC properties is the Verdugo Fault, which is approximately 1 mile to the northeast and trends northwesterly along the base of the Verdugo Mountains (Tetra Tech, 2006).

2.2 HYDROGEOLOGY

The PAC properties are located within the San Fernando Basin (SFB), one of four distinct groundwater basins that encompass the entire watershed of the Los Angeles River and its tributaries within the SFV (also known as the Upper Los Angeles River Area, or ULARA). Groundwater within the eastern portion of the SFB flows mainly through two sedimentary units: (1) Older Alluvium of Pleistocene age and (2) Younger Alluvium of Holocene age. The Older Alluvium is composed of sand, gravel, and boulders in the northwestern portion of the BOU and interbedded silt and sand in the eastern and southern portions of the BOU. The Younger Alluvium is composed of coarse sand, gravel, and cobbles interbedded with finer-grained units of sand, silty sand, sandy silt, silty clay, and minor gravelly sand. Groundwater flow within the Older Alluvium has been observed to be locally semi-confined to confined. The Younger Alluvium is generally unconfined to semi-confined, depending upon the location and thickness of fine-grained interbeds (Tetra Tech, 2006).

The aquifer in the Younger Alluvium within the BOU has been divided into five hydrostratigraphic units (HSUs) based on electrical resistivity responses in geophysical logs (Hargis & Associates, 1991; Simon Hydro-Search, 1993). The five HSUs of the Younger Alluvium are identified, from upper to lower, as A', X, A, Y, and B. The A', A, and B units are generally composed of coarser-grained material (coarse sands, gravels, and cobbles). The X and Y HSUs separate the other three HSUs listed above (A', A, B) and consist of relatively finer-grained material including sand, silty sand, and silt. Based on the stratigraphic position of the units and the groundwater gradient, the A', X, or A HSU may locally represent water table conditions, depending on geographic location within the project area.

3.0 DESCRIPTION OF HISTORICAL AREAS OF CONCERN

3.1 1987 SPILL INCIDENT AND INITIAL ASSESSMENTS

After reporting a jet fuel spill to the Los Angeles Regional Water Quality Control Board (LA-RWQCB) in 1987, PAC agreed to install MW-1 and MW-2 at the Jet Engine Test Facility downgradient of the fuel spill area. In 1992, in an effort directed by the LA-RWQCB to assess the groundwater analytes underlying the PAC properties, additional monitoring well MW-3 was installed at the Jet Engine Test Cell Facility and wells MW-4 through MW-8 were installed at the Main Facility (Figure 3-1).

The EPA issued a Unilateral Administrative Order (UAO) in 1994, which required PAC to perform soil and groundwater investigations. As part of the soil investigation, PAC conducted soil gas surveys across the PAC properties to assess the nature and extent of vapor and non-vapor phase analytes in the unsaturated zone. Since 1997, when PAC became an indirect wholly owned subsidiary of GE, PAC, through GE technical and legal representatives acting on its behalf, has been working with the LA-RWQCB to further investigate and remediate PAC properties (Tetra Tech, 2006).

3.2 GROUNDWATER MONITORING 1988 - 1995

Semiannual groundwater monitoring from June 1987 through December 1988 indicated elevated levels of trichloroethene (TCE) and tetrachloroethene (PCE) in monitoring wells MW-1 and MW-2 (Table 3-1). Groundwater monitoring from September 1992 through January 1995 showed PCE and TCE concentrations exceeding regulatory maximum contaminant levels (MCLs) of 5 micrograms per liter ($\mu\text{g/L}$) in wells MW-3 through MW-8 (Table 3-2). Monitoring wells MW-1 and MW-2 were both dry during this time period.

3.3 2006 QUARTERLY GROUNDWATER MONITORING TREND ANALYSIS

Tetra Tech performed a trend analysis of the 2006 quarterly groundwater monitoring data for the PAC site performed during February 2007. In general, the trend analysis indicated relatively stable conditions with no significant changes in the concentrations of the chemicals of concern (COCs) (Tetra Tech 2007). The PAC wells experienced a rise

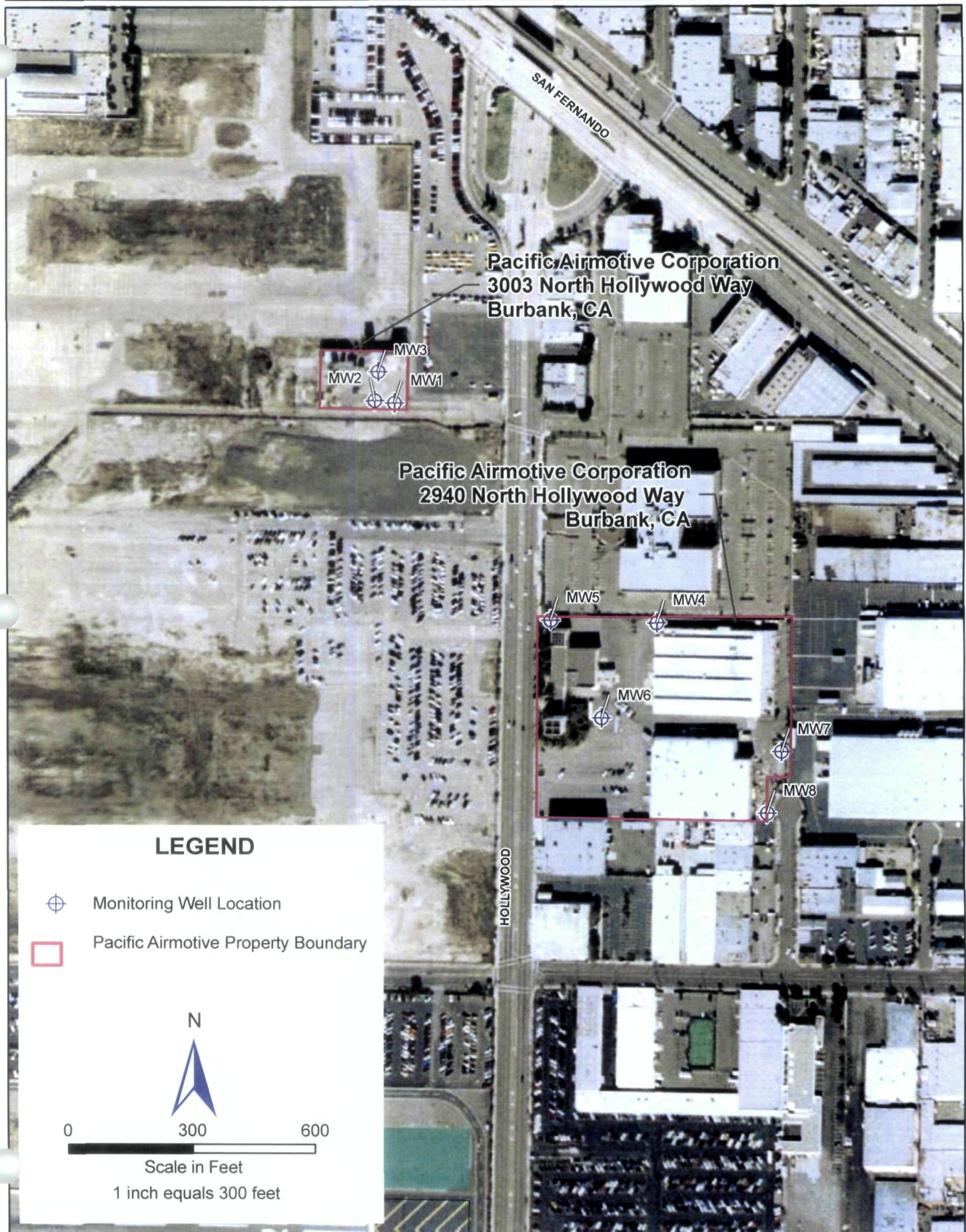


Figure 3-1 - PAC Wells Location Map

Table 3-1
Historical Analytical Data From 1987 to 1989
(micrograms per liter)

	6/18/87		12/29/87		6/14/88		12/15/88	
	PCE	TCE	PCE	TCE	PCE	TCE	PCE	TCE
WQO	5 ^{1,2}	5 ^{1,2}	5 ^{1,2}	5 ^{1,2}	5 ^{1,2}	5 ^{1,2}	5 ^{1,2}	5 ^{1,2}
Composite of MW-1 & MW-2	130	32	NA	NA	NA	NA	NA	NA
MW-1	130*	32*	67	24	160	31	75	12
MW-2	130*	32*	190	41	200	33	130	15

Notes: WQO – water quality objective
 NA – Not available
 1 – California Primary Maximum Contaminant Level for Drinking Water (CVRWQCB 2007)
 2 – California Secondary Maximum Contaminant Level for Drinking Water (CVRWQCB 2007)
 Analytical results exceeding the WQO are shown in **bold**.
 * Result based on composite sample.

Table 3-2
Historical Analytical Data From 1992 to 1995
(micrograms per liter)

Well ID	9/15–16/92		12/16–19/92		7/19–20/94		12/25–26/94		1/30–31/95	
	PCE	TCE	PCE	TCE	PCE	TCE	PCE	TCE	PCE	TCE
WQO	5 ^{1,2}	5 ^{1,2}	5 ^{1,2}	5 ^{1,2}	5 ^{1,2}	5 ^{1,2}	5 ^{1,2}	5 ^{1,2}	5 ^{1,2}	5 ^{1,2}
MW-1	dry	dry	dry	dry	dry	dry	dry	dry	dry	dry
MW-2	dry	dry	dry	dry	dry	dry	dry	dry	dry	dry
MW-3	39	11	47	12	18	6.4	58	8.8	63	7.8
MW-4	460	46	400	41	22	6.3	25	3.6	13	2.2
MW-5	2,100	440	64	13	40	8.9	150	24	49	6.9
MW-6	910	250	490	120	39	7.4	1,300	170	800	110
MW-7	87	18	420	49	43	11	2,000	88	490	19
MW-8	1,700	160	1,200	94	21	5.1	1,800	170	1,800	130

Notes: WQO – water quality objective
 1 – U.S. Environmental Protection Agency Maximum Contaminant Level for Drinking Water (CVRWQCB 2007)
 2 – California Primary Maximum Contaminant Level for Drinking Water (CVRWQCB 2007)
 Analytical results exceeding the WQO are shown in **bold**.

in groundwater elevation between the first and last quarters. This rise corresponded to the rainfall patterns for 2006 (Figure 3-2).

PCE was detected in all PAC wells during four quarters of 2006 and exhibited variable trends (Figure 3-3 and Table 3-3). The PCE concentrations detected in samples collected

Figure 3-2
2006 PAC Wells Groundwater Elevation Trends

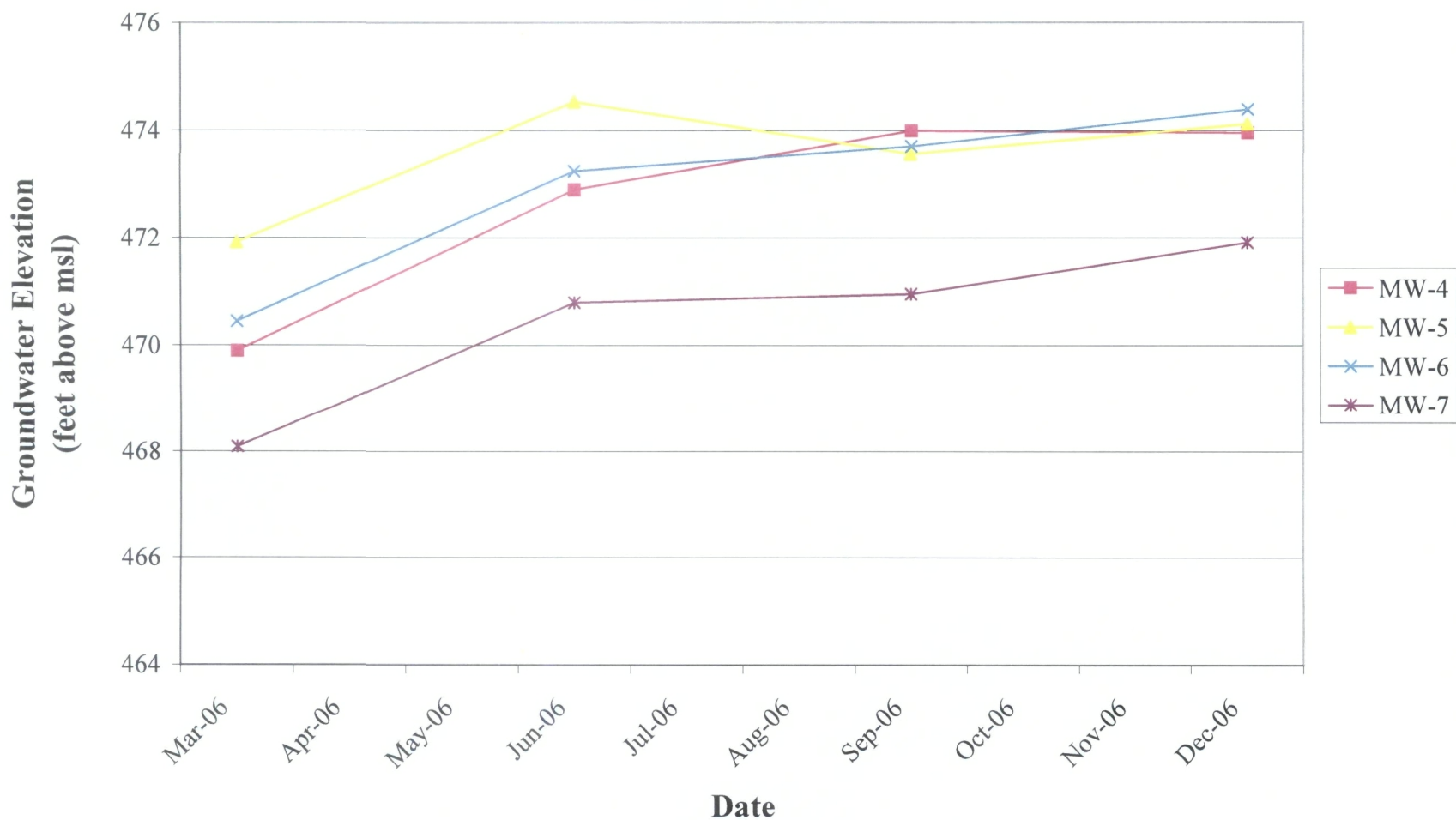


Figure 3-3
2006 PAC Wells Tetrachloroethene (PCE) Trends

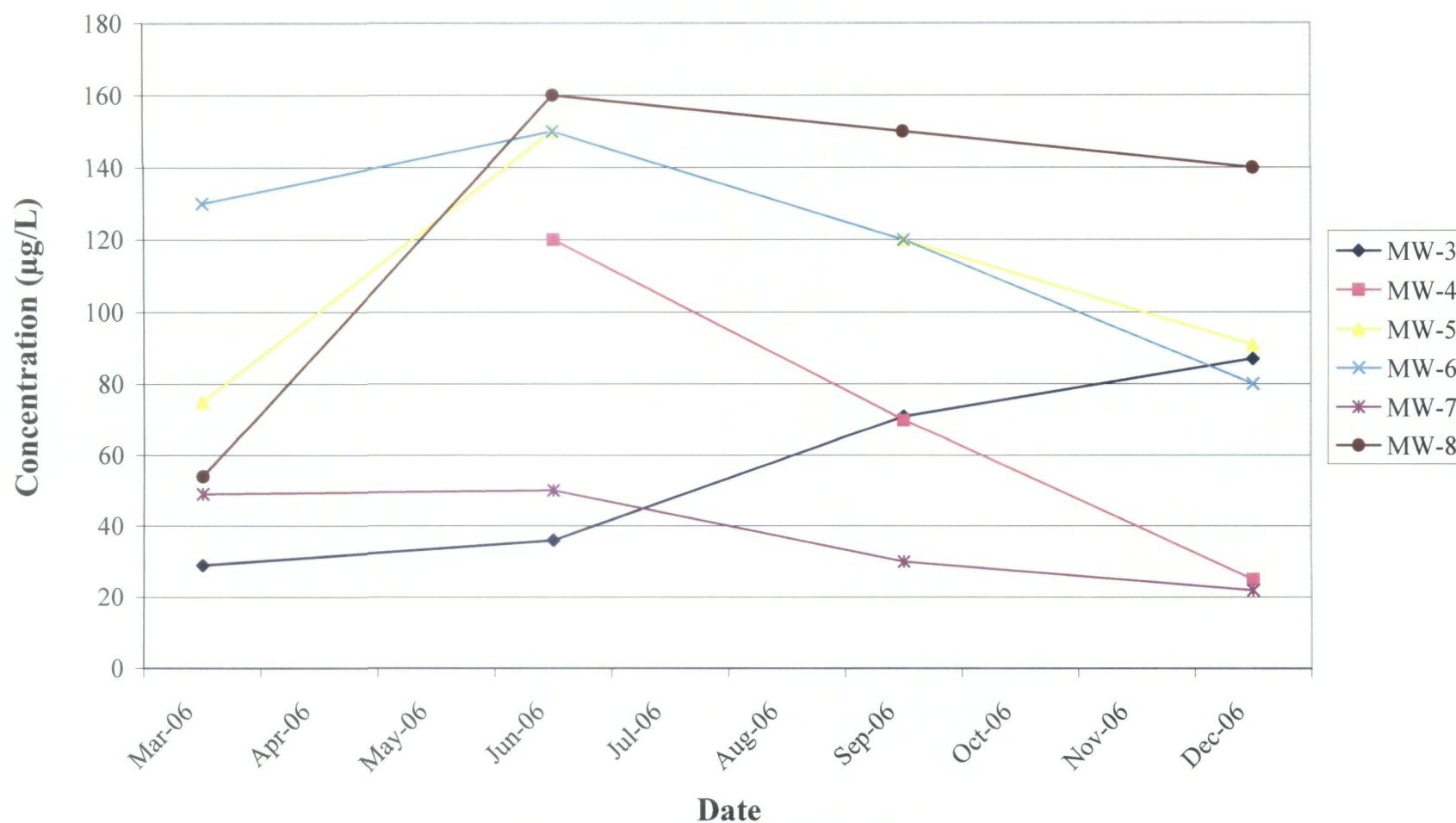


Table 3-3
TCE and PCE Data From 2006
(micrograms per liter)

Well ID	3/24/2006		6/6/2006		9/13/2006		12/11/2006	
	PCE	TCE	PCE	TCE	PCE	TCE	PCE	TCE
WQO	5 ^{1,2}	5 ^{1,2}	5 ^{1,2}	5 ^{1,2}	5 ^{1,2}	5 ^{1,2}	5 ^{1,2}	5 ^{1,2}
MW-1	dry	dry	dry	Dry	dry	Dry	dry	Dry
MW-2	dry	dry	dry	Dry	dry	dry	dry	Dry
MW-3	29	8.3	36	12	71	24	87	27
MW-4	-		120	48	70	27	25	11
MW-5	75	32	150	84	120	66	91	69
MW-6	130	69	150	75	120	66	80	57
MW-7	49	18	50	17	30	8.9	22	8.8
MW-8	54	23	160	58	150	60	140	54

Notes: WQO – water quality objective
PCE – Tetrachloroethene
TCE – Trichloroethene
1 – U.S. Environmental Protection Agency Maximum Contaminant Level for Drinking Water (CVRWQCB 2007)
2 – California Primary Maximum Contaminant Level for Drinking Water (CVRWQCB 2007)
Analytical results exceeding the WQO are shown in **bold**.

from wells MW-3, MW-5, MW-6, and MW-8 exhibited an increase in concentrations between the first and second quarters 2006. However, this increasing trend continued through the fourth quarter only in one well (MW-3). Wells MW-4, MW-5, MW-6, MW-7, and MW-8 exhibited decreasing PCE concentrations after the second quarter 2006. All PCE detections were above the water quality objective (WQO) of 5 µg/L.

TCE was detected at least once in all PAC wells during four quarters of 2006, showing mixed trends (Figure 3-4 and Table 3-3). TCE concentrations in wells MW-3, MW-5, MW-6, and MW-8 showed an increase while wells MW-4 and MW-7 showed a decrease. The trends became stabilized or decreased for these wells after the second quarter 2006, except for in well MW-3. All TCE detections were above the WQO of 5 µg/L, with concentrations ranging from 8.3 µg/L in well MW-3 (first quarter 2006) to 84 µg/L in well MW-5 (second quarter 2006).

1,2,3-TCP was detected all PAC wells with mixed trends during four quarters of 2006 (Figure 3-5 and Table 3-4). The highest concentration of 1,2,3-TCP at 0.23 µg/L was

Figure -3-4
2006 PAC Wells Trichloroethene (TCE) Trends

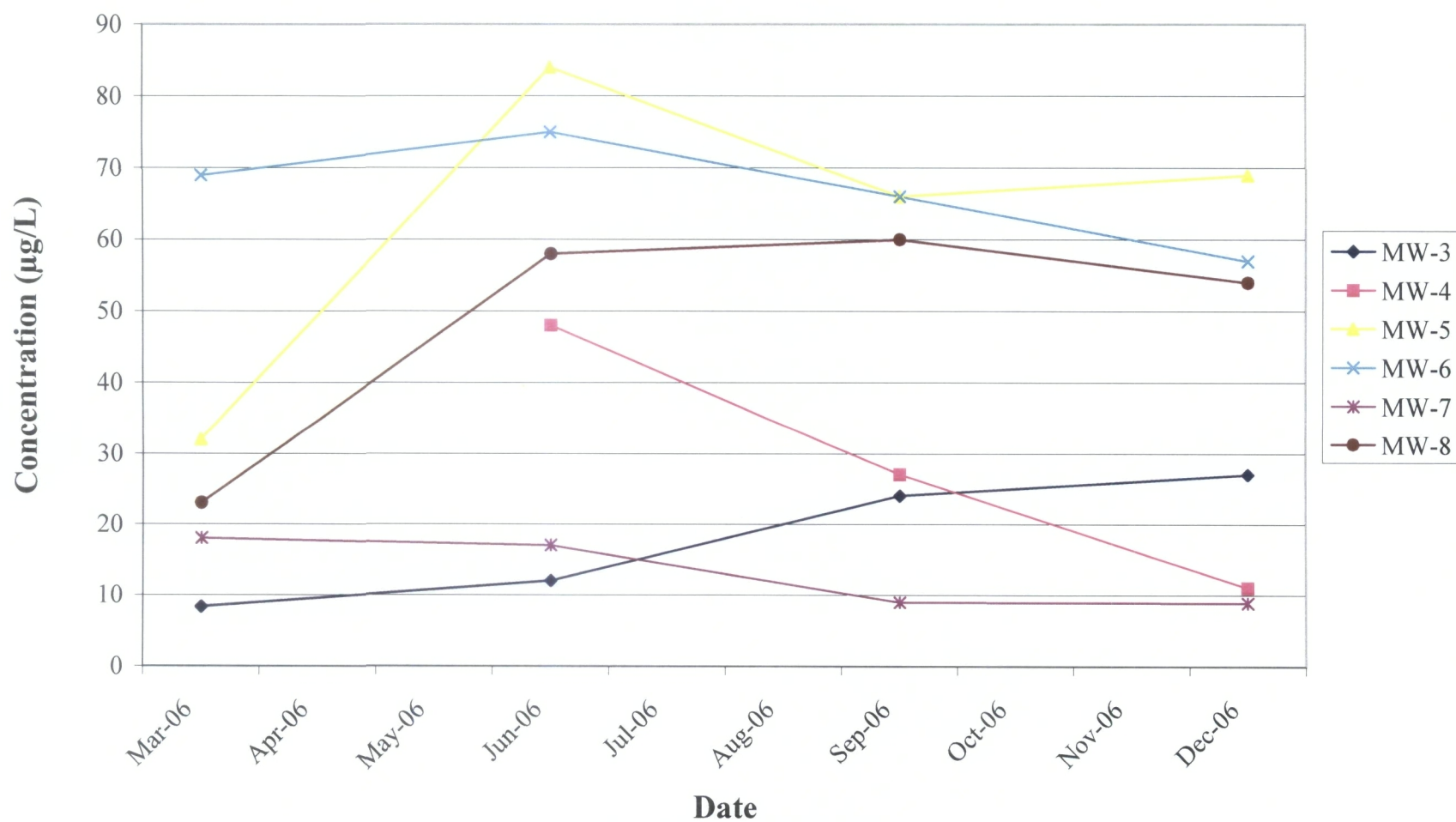


Figure 3-5
2006 PAC Wells 1,2,3-Trichloropropane (1,2,3-TCP) Trends

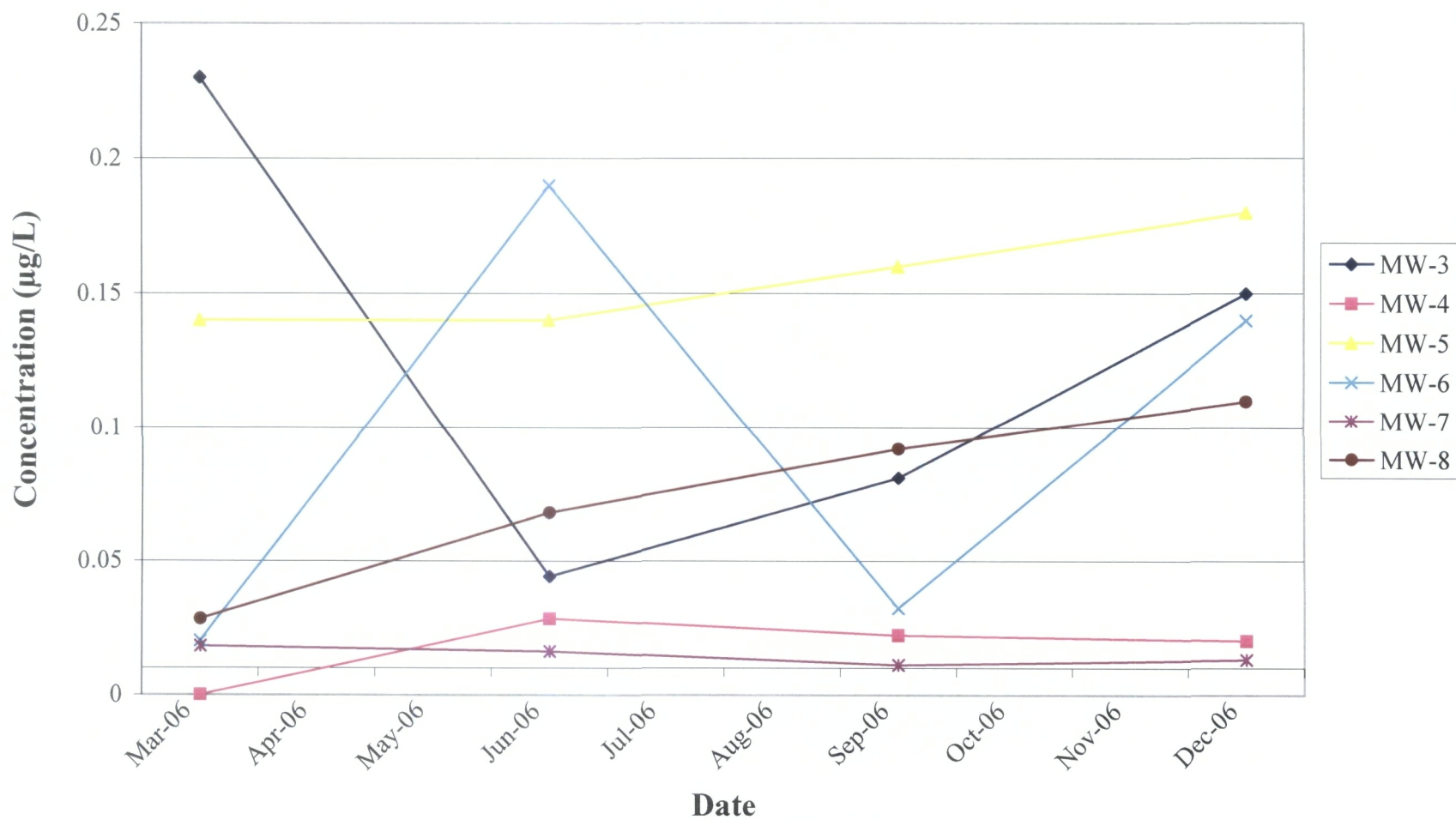


Table 3-4
1,2,3-TCP Data From 2006
(micrograms per liter)

Well ID	3/24/2006	6/6/2006	9/13/2006	12/11/2006
WQO	0.005 ¹	0.005 ¹	0.005 ¹	0.005 ¹
MW-1	Dry	dry	dry	Dry
MW-2	Dry	dry	dry	Dry
MW-3	0.23	0.044	0.081	0.15
MW-4	-	0.028	0.022	0.02
MW-5	0.14	0.14	0.16	0.18
MW-6	0.02	0.19^B	0.032	0.14
MW-7	0.018	0.016	0.011	0.013
MW-8	0.028^B	0.068	0.092	0.11

Notes: WQO – water quality objective
1,2,3-TCP – 1,2,3-trichloropropane
1 – California Department of Health Services Drinking Water Notification Level (CVRWQCB 2007)
Analytical results exceeding the WQO are shown in **bold**.

detected in PAC well MW-3 during the first quarter 2006. Wells MW-5 and MW-8 showed increasing 1,2,3-TCP concentrations throughout the year. Well MW-3 initially showed a decrease in 1,2,3-TCP (from 0.23 to 0.044 $\mu\text{g/L}$) between first and second quarters 2006, followed by an increase in 1,2,3-TCP during the next two consecutive quarters. No trend was indicated for well MW-6 due to highly variable 1,2,3-TCP concentrations. MW-4 and MW-7 were the only wells that showed a stable or decreasing trend in 1,2,3-TCP concentrations. All 1,2,3-TCP detections were above the WQO of 0.005 $\mu\text{g/L}$, with concentrations ranging from 0.011 $\mu\text{g/L}$ (well MW-7, third quarter 2006) to 0.23 $\mu\text{g/L}$ (well MW-3, first quarter 2006).

Hexavalent chromium was detected at least once in all PAC wells sampled during four quarters of 2006 (Figure 3-6 and Table 3-5). The concentrations of hexavalent chromium were generally stable in most PAC wells. All hexavalent chromium detections were well below the WQO of 50 $\mu\text{g/L}$.

1,4-Dioxane was not detected in PAC wells during 2006.

Figure 3-6
2006 PAC Wells Hexavalent Chromium Trends

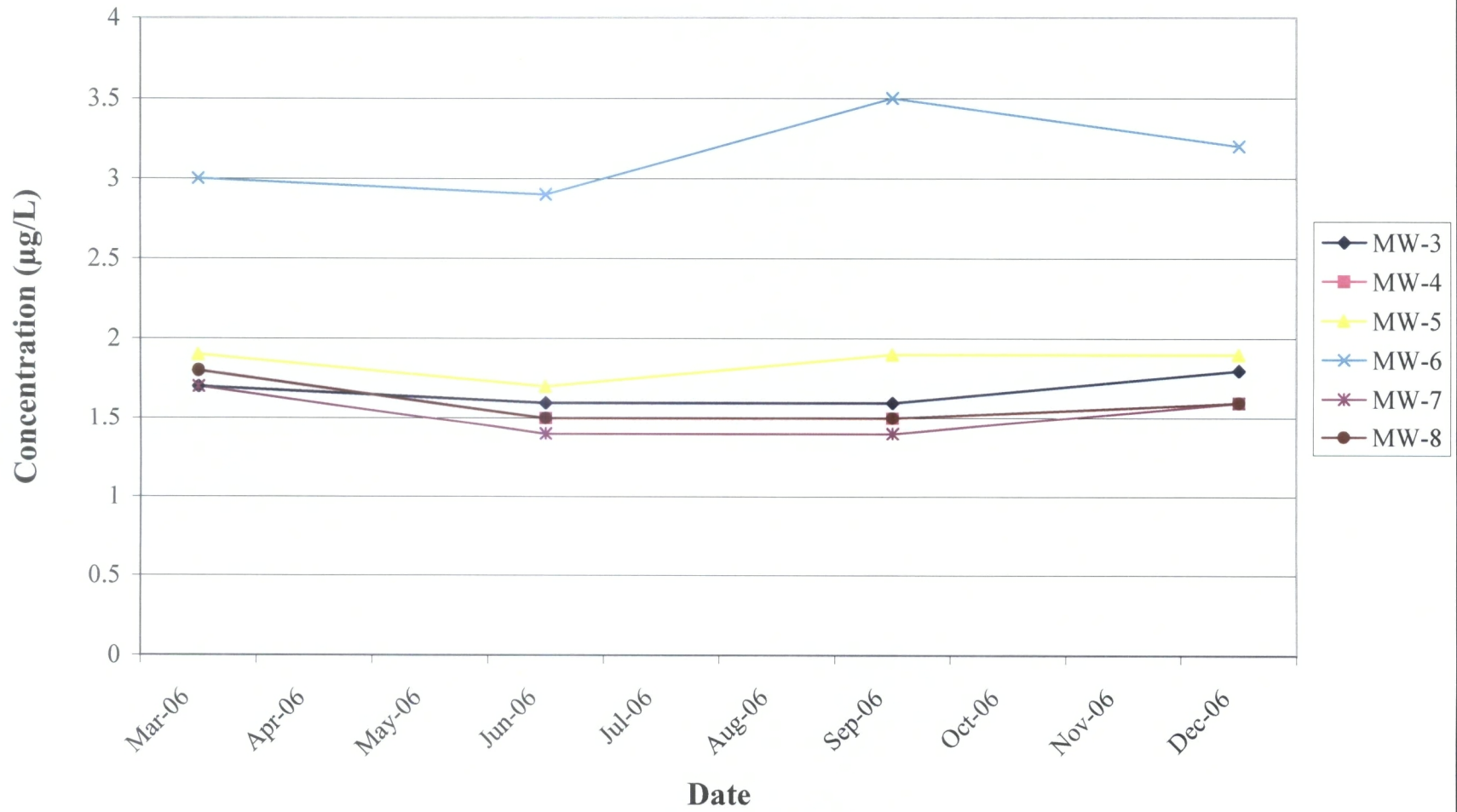


Table 3-5
Hexavalent Chromium Data From 2006
(micrograms per liter)

Well ID	3/24/2006	6/6/2006	9/13/2006	12/11/2006
WQO	50 ¹	50 ¹	50 ¹	50 ¹
MW-1	dry	Dry	dry	Dry
MW-2	dry	Dry	dry	Dry
MW-3	1.7	1.6	1.6	1.8
MW-4	-	1.5	1.5	1.6
MW-5	1.9	1.7	1.9	1.9
MW-6	3	2.9	3.5	3.2
MW-7	1.7	1.4	1.4	1.6
MW-8	1.8	1.5	1.5	1.6

Notes: WQO – water quality objective

1 – California Primary Maximum Contaminant Level for Drinking Water (CVRWQCB 2007)

Hexavalent chromium is currently regulated using the MCL for total chromium.

Analytical results exceeding the WQO are shown in **bold**.

4.0 GROUNDWATER MONITORING PROCEDURES

4.1 GROUNDWATER LEVEL MEASUREMENTS

Water levels in the eight monitoring wells were measured in the first (March), second (June), and third (September) quarters of 2007. Water level measurements are presented in Table 4-1. Groundwater elevation contours are shown on Figures 4-1 through 4-3. The groundwater flow direction during the first, second, and third quarters of 2007 was to the southeast with an approximate gradient of 0.05 during all three monitoring events.

Table 4-1
Summary of First, Second, and Third Quarter 2007 Groundwater Elevations

Well Number	HSU	Date Measured	Top of Casing Elevation (ft above msl)	Groundwater Depth (ft) from TOC	Groundwater Elevation (ft above msl)
MW-1	NA	3/22/2007	719.40	227.18	429.22
MW-2	NA	3/22/2007	720.04	238.40	481.64
MW-3	NA	3/22/2007	720.44	237.55	482.89
MW-4	A	3/22/2007	700.15	220.96	479.19
MW-5	A	3/22/2007	701.96	226.50	475.46
MW-6	A	3/22/2007	700.95	223.48	477.47
MW-7	A	3/22/2007	696.16	223.10	473.06
MW-8	A	3/22/2007	702.93	224.99	477.94
MW-1	NA	6/20/2007	719.40	240.02	479.38
MW-2	NA	6/20/2007	720.04	DRY	DRY
MW-3	NA	6/20/2007	720.44	238.38	482.06
MW-4	A	6/20/2007	700.15	223.98	476.17
MW-5	A	6/20/2007	701.96	225.88	476.08
MW-6	A	6/20/2007	700.95	224.40	476.55
MW-7	A	6/20/2007	696.16	221.42	474.74
MW-8	A	6/20/2007	702.93	227.44	475.49
MW-1	NA	9/26/2007	719.40	240.21	479.19
MW-2	NA	9/26/2007	720.04	DRY	DRY
MW-3	NA	9/26/2007	720.44	240.55	479.89
MW-4	A	9/26/2007	700.15	226.11	474.04
MW-5	A	9/26/2007	701.96	228.01	473.95
MW-6	A	9/26/2007	700.95	226.55	474.40
MW-7	A	9/26/2007	696.16	223.97	472.19
MW-8	A	9/26/2007	702.93	229.60	473.33

Notes: HSU = Hydrostatic unit
TOC = Top of casing
msl = Mean sea level
NA = Not available

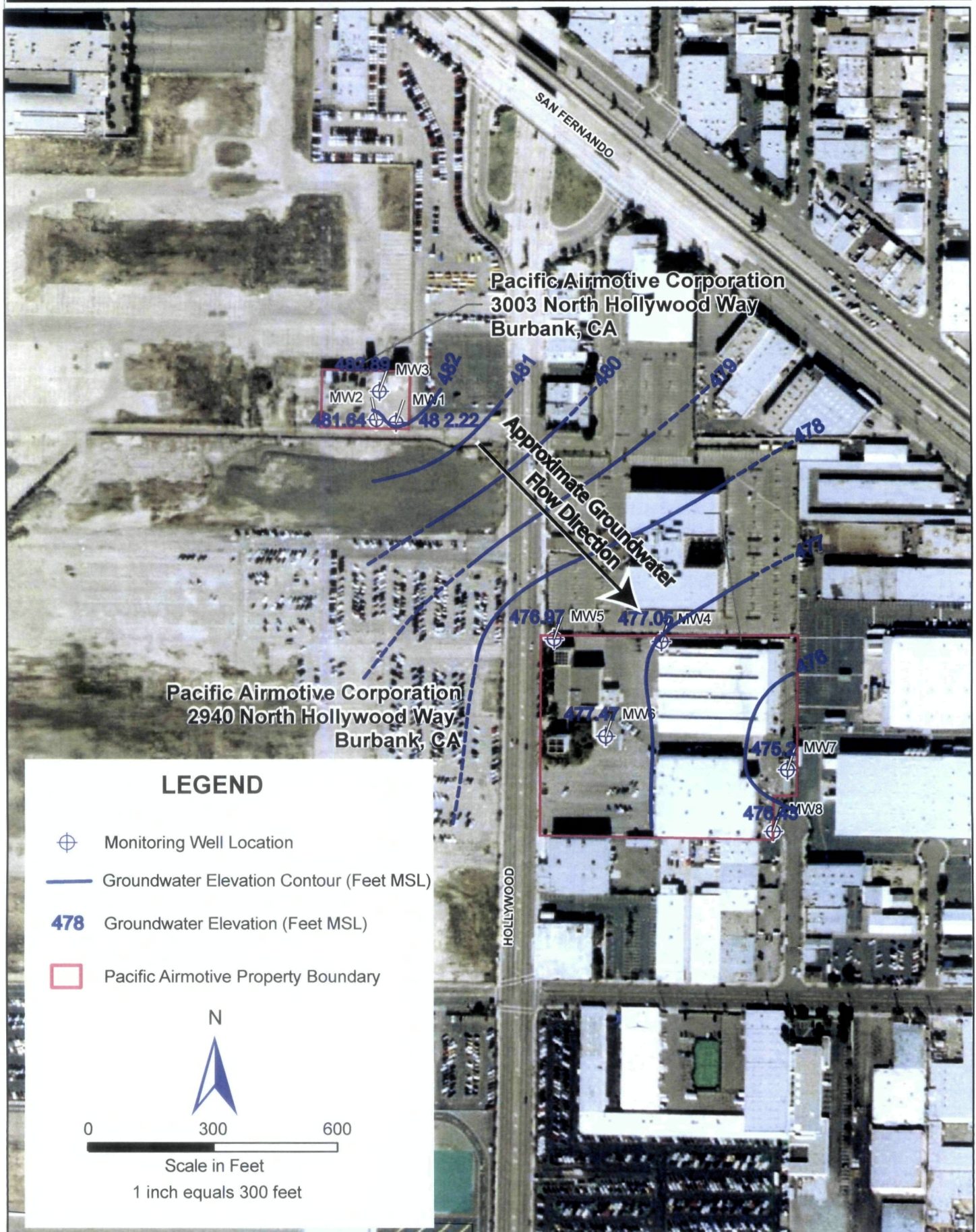


Figure 4-1 - First Quarter 2007 WT HSU Groundwater Elevation, PAC

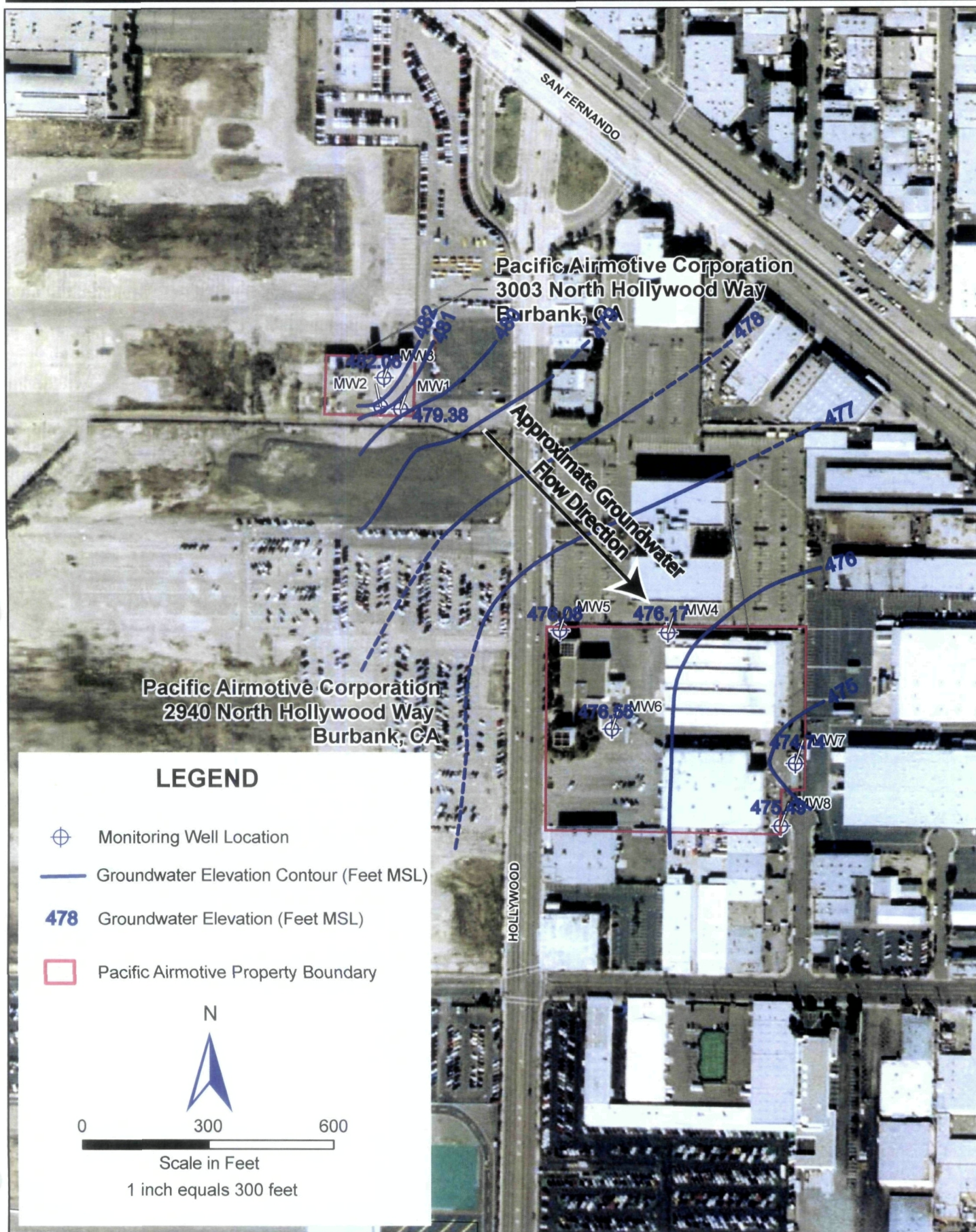


Figure 4-2 - Second Quarter 2007 WWSU Groundwater Elevation, PAC

FINAL GROUNDWATER MONITORING REPORT, FIRST, SECOND, AND THIRD QUARTERS OF 2007,
PACIFIC AIRMOTIVE CORPORATION, 2940 AND 3003 NORTH HOLLYWOOD WAY, BURBANK, CALIFORNIA

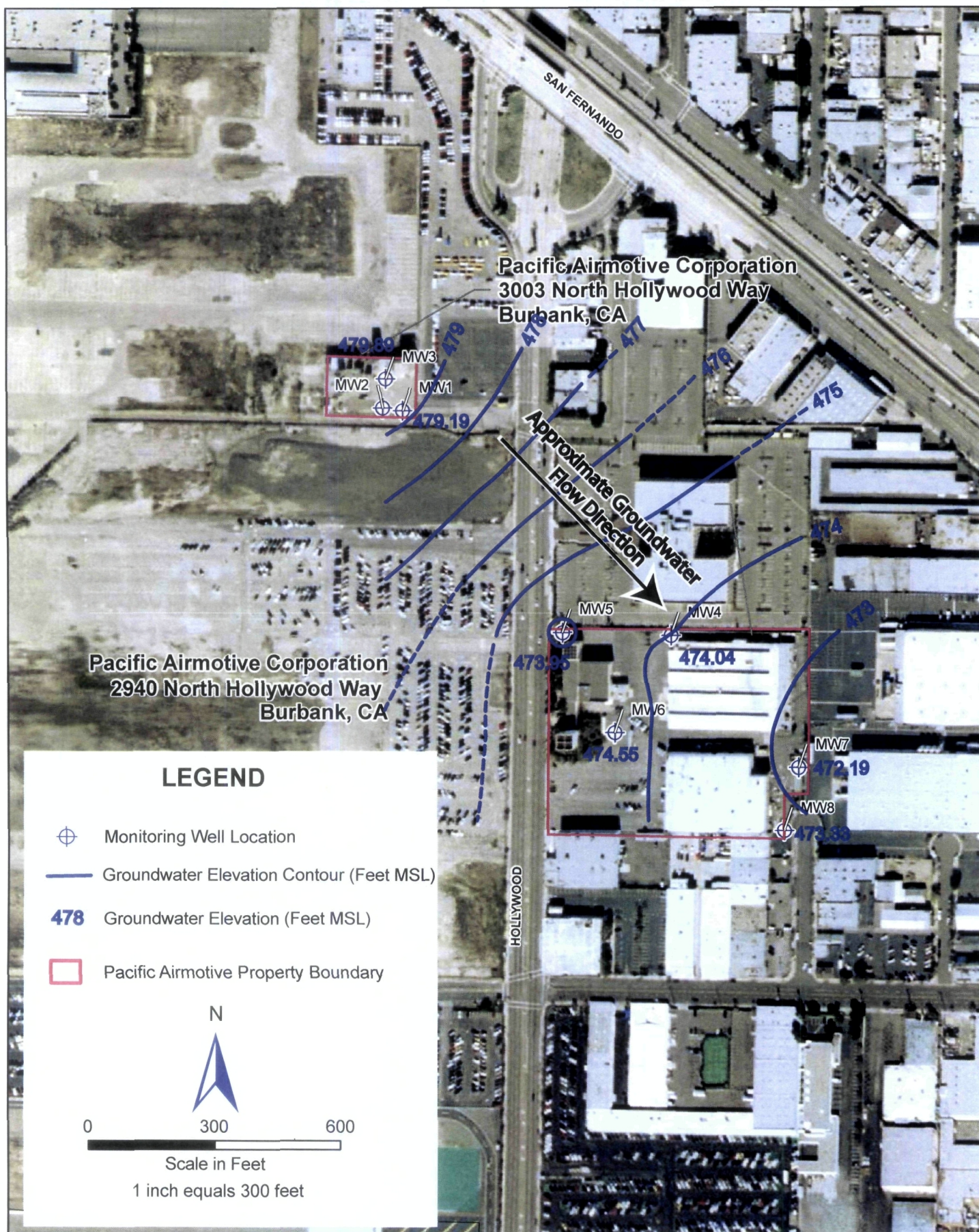


Figure 4-3 - Third Quarter 2007 WHSU Groundwater Elevation, PAC

4.2 WELL PURGING AND SAMPLING

Groundwater samples were collected from six groundwater monitoring wells (MW-3 through MW-8) on June 25, 2007 at the PAC facility. Before groundwater sample collection, a minimum of three well volumes of water was purged from monitoring wells MW-3 through MW-8 using a submersible pump (well MW-2 was dry and well MW-1 had insufficient water to sample). Water temperature, pH, conductivity, dissolved oxygen, and turbidity were measured throughout the purging process using a Horiba U-10 water quality monitoring instrument. Stabilization of these parameters indicated that the well water was representative of the formation water. The water quality monitoring data were recorded on well purging forms (Appendix A).

Groundwater sampling was accomplished using a down-hole submersible pump. Groundwater samples were collected from a nozzle attached to the pump hose and placed directly into sample containers provided by the laboratory. Decontamination procedures were followed after sampling each monitoring well to avoid cross-contamination between wells. The water sample containers were placed on ice in a cooler to maintain a temperature of 4 ± 2 degrees Celsius ($^{\circ}\text{C}$) pending delivery to American Environmental Testing Laboratories, Inc. (AETL), a State of California accredited laboratory for the prescribed chemical analyses. A completed chain-of-custody form accompanied the shipment of samples to the laboratory to ensure accountability and integrity of the samples from the time of collection to the time of analyses.

4.3 LABORATORY ANALYSIS

In the letter dated June 8, 2007, the EPA has requested that groundwater samples from the PAC wells be analyzed for specific constituents using analytical methods consistent with those of the BOU groundwater sampling events. The analytes and analytical methods are as follows:

- VOCs, including methyl *tert*-butyl ether (MTBE), using EPA Method 8260B;
- 1,2,3-TCP using EPA Method 8260B-SIM;
- Dissolved (total) chromium, using EPA Method 6010B;
- Hexavalent chromium using EPA Method 218.6;

- 1,4-dioxane using EPA Method 8260B M;
- Nitrate/nitrite using EPA Method 300.0; and
- Thallium using EPA Method 6010B/7000 Filtered.

5.0 GROUNDWATER ANALYTICAL RESULTS

Groundwater monitoring well analytical results were validated for usability and compared to their respective water quality objectives (WQOs). Copies of the laboratory analytical data reports are included in Appendix B. The validated analytical results are presented in Tables 5-1 and 5-2.

5.1 DATA VERIFICATION AND VALIDATION

In order to determine the quality and usability of the analytical results, the laboratory analytical results were reviewed and validated according to the *U.S. EPA Contract Laboratory Program National Functional Guidelines* (EPA, 1999) and *U.S. EPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review* (EPA, 2002). As part of the data evaluation, the laboratory data underwent verification and validation including laboratory control samples (LCS), matrix spike duplicates (MSD), and method blanks (MB). All samples were validated as specified in Appendix C, which presents a summary of the quality control and quality assurance (QA/QC) procedures and the complete validated data tables used for this report.

Based on the validation of the second quarter 2007 analytical data, certain analytical results were qualified according to the criteria set forth in the *U.S. EPA Contract Laboratory Program National Functional Guidelines* (EPA, 1999). Data results that were estimated based on their values or QC sample fault were qualified with a "J." A description of the qualifiers is provided below.

QA samples included a blind duplicate groundwater sample collected from well MW-8 (designated as sample MW-9 on the COC in Appendix B), a field blank (designated as sample PAC062607FB on the COC in Appendix B), and a trip blank (designated as sample PAC062607TB on the COC in Appendix B). In addition, AETL split the sample collected from well MW-8 and created an additional duplicate sample (designated as sample MW-8 DUP in the laboratory report in Appendix B).

"J" Qualified Data

Analytical data are considered to be "J" qualified when constituents are detected at concentrations that are above the method detection limit (MDL) but below the practical

quantitation limit (PQL) or reporting limit (RL) of the analytical instrument. For the purpose of this report, all of the data qualified as estimated with a "J" qualifier are usable and are represented with a "J" in the report text and tables.

5.2 VOC ANALYTICAL RESULTS

Groundwater samples collected from six groundwater monitoring wells were analyzed for VOCs. After data validation, certain VOC analytes were qualified. A summary of the analytical results is presented in Table 5-1 and discussed below.

- **Carbon Tetrachloride** was detected in samples collected from four groundwater monitoring wells (MW-3, MW-5, MW-6, and MW-8) at concentrations of 1.10 µg/L, 1.90 µg/L, 1.60 µg/L, and 1.60 µg/L, respectively.
- **Chloroform** was detected in samples collected from five groundwater monitoring wells (MW-3, MW-5, MW-6, MW-7, and MW-8) at concentrations ranging from 0.69J µg/L (MW-7) to 2.90 µg/L (MW-3).
- **1,2-Dichloroethane** was detected in samples collected from three groundwater wells (MW-3, MW-5, and MW-8) at concentrations of 1.30 µg/L, 0.68J µg/L, and 1.60 µg/L, respectively.
- **1,1-Dichloroethene** was detected in samples collected from five groundwater wells (MW-3, MW-4, MW-5, MW-6, and MW-8) at concentrations ranging from 1.92 µg/L (MW-4) to 12.1 µg/L (MW-3).
- **Tetrachloroethene** was detected in samples collected from all six groundwater wells at concentrations ranging from 51.7 µg/L (MW-7) to 170 µg/L (MW-8).
- **1,1,2-Trichloro-1,2,2-trifluoroethane** was detected in samples collected from four groundwater wells (MW-3, MW-5, MW-6, and MW-8) at concentrations of 6.83 µg/L, 2.89J µg/L, 1.85J µg/L, and 1.66J µg/L, respectively.
- **1,1,1-Trichloroethane** was detected in samples collected from three groundwater wells (MW-3, MW-5, and MW-6) at a concentrations of 1.10 µg/L, 0.60J µg/L, and 0.60J µg/L, respectively.
- **Trichloroethene** was detected in samples collected from all six groundwater wells at concentrations ranging from 10.0 µg/L (MW-7) to 59.7 µg/L (MW-8).

A review of the VOC analytical data shows that five compounds were detected at concentrations above their respective WQOs. Carbon tetrachloride was detected above the WQO of 0.5 µg/L in four wells (MW-3, MW-5, MW-6, and MW-8). 1,2-

dichloroethane was detected above the WQO of 0.5 µg/L in three wells (MW-3, MW-5, and MW-8). 1,1-dichloroethene was detected above the WQO of 6 µg/L in five wells (MW-3, MW-4, MW-5, MW-6, and MW-8). Tetrachloroethene was detected above the WQO of 5 µg/L in all six wells. Trichloroethene was also detected above the WQO of 5 µg/L in all six wells.

Table 5-1
Summary of VOCs Analytical Results
EPA Method 8260B
(micrograms per liter)

Well ID	Carbon Tetrachloride	Chloroform	1,2-Dichloroethane	1,1-Dichloroethene	Tetrachloroethene	1,1,2-Trichloro-1,2,2-trifluoroethane	1,1,1-Trichloroethane	Trichloroethene
WQO	0.5²	80^{1,2}	0.5²	6²	5^{1,2}	1,200²	200^{1,2}	5^{1,2}
MDL	0.20	0.50	0.50	0.50	0.50	1.00	0.50	0.50
MW-3	1.10	2.90	1.30	12.1	143	6.83	1.10	38.2
MW-4	<0.20	<0.50	<0.50	1.92	66.5	<1.00	<0.50	14.8
MW-5	1.90	2.20	0.68J	6.22	136	2.89J	0.60J	52.3
MW-6	1.60	2.10	<0.50	6.30	105	1.85J	0.60J	37.4
MW-7	<0.20	0.69J	<0.50	<0.50	51.7	<1.00	<0.50	10.0
MW-8	1.60	1.40	1.60	2.80	170	1.66J	<0.50	59.7

Notes: MDL – method detection limit
WQO – water quality objective
1 – U.S. Environmental Protection Agency Maximum Contaminant Level for Drinking Water (CVRWQCB 2007)
2 – California Primary Maximum Contaminant Level for Drinking Water (CVRWQCB 2007)
J – Analyte was detected at a concentration below the reporting limit and above the laboratory method detection limit. Reported value is estimated.
Analytical results exceeding the WQO are shown in **bold**.

5.3 EMERGENT CHEMICALS ANALYTICAL RESULTS

Groundwater samples collected from the six monitoring wells were analyzed for 1,4-dioxane and 1,2,3-TCP. Based on the validation performed on the data from the emergent chemical analyses, all analytical results are deemed usable. A summary of the analytical results is presented in Table 5-2 and discussed below.

- **1,4-Dioxane** was not detected above the laboratory reporting limit in any of the groundwater samples analyzed.
- **1,2,3-TCP** was detected in all six (6) groundwater wells at concentrations ranging from 0.015 ug/L (MW-4) to 1.86 µg/L (MW-3).

Additionally, all of the 1,2,3-TCP detections exceeded its WQO of 0.005 µg/L.

Table 5-2
Emergent Chemicals and Inorganic Analytical Results

Well ID	1,2,3-TCP by EPA Method 524M (µg/L)	Total Chromium (mg/L)	Hexavalent Chromium (µg/L)	Nitrate (mg/L)	Thallium (mg/L)
WQO	0.005¹	50²	50²	10³	0.002^{2,3}
MDL	<i>0.001</i>	<i>0.001</i>	<i>0.10</i>	<i>0.20</i>	<i>0.001</i>
MW-3	1.86	<0.001	<0.10	16.1	0.016
MW-4	0.15	<0.001	<0.10	14.1	<0.001
MW-5	1.16	0.003J	2.26	15.4	0.006
MW-6	0.81	0.003J	2.28	14.1	0.015
MW-7	0.17	<0.001	<0.10	13.1	<0.001
MW-8	0.24	0.002J	<0.10	14.0	<0.001

Notes: MDL – Method Detection Limit
 µg/L – micrograms per liter
 mg/L – milligrams per liter
 WQO – Water Quality Objective
 1,2,3-TCP – 1,2,3-trichloropropane
 1 – California Department of Health Services Drinking Water Notification Level (CVRWQCB 2007)
 2 – California Primary Maximum Contaminant Level for Drinking Water (CVRWQCB 2007)
 Hexavalent chromium is currently regulated using the MCL for total chromium.
 3 – U.S. Environmental Protection Agency Primary Maximum Contaminant Level for Drinking Water (CVRWQCB 2007)
 J – Analyte was detected at a concentration below the reporting limit and above the laboratory method detection limit. Reported value is estimated.
 Analytical results exceeding the WQO are shown in **bold**.

5.4 INORGANIC ANALYTICAL RESULTS

Groundwater samples collected from the six monitoring wells were analyzed for total chromium, hexavalent chromium, nitrate, and thallium. A summary of the analytical results is presented in Table 5-2 and discussed below.

- **Total Chromium** was detected in three of the six groundwater monitoring wells (MW-5, MW-6, and MW-8) at concentrations of 0.003J milligrams per liter (mg/L), 0.003J mg/L, and 0.002J mg/L, respectively.
- **Hexavalent Chromium** was detected in two groundwater monitoring wells (MW-5 and MW-6) at concentrations of 2.26 $\mu\text{g/L}$ and 2.28 $\mu\text{g/L}$, respectively.
- **Nitrate** was detected in all six groundwater monitoring wells at concentrations ranging from 13.1 mg/L (MW-7) to 16.1 mg/L (MW-3).
- **Thallium** was detected in three of the six groundwater monitoring wells (MW-3, MW-5, and MW-6) at concentrations of 0.016 mg/L, 0.006 mg/L, and 0.015 mg/L, respectively.

Inorganic compounds were not detected above their respective WQOs in any of the samples analyzed.

6.0 REFERENCES

California Department of Health Services (DHS)

2006 *Drinking Water Notification Levels and Response Levels: An Overview.*

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<http://www.dhs.ca.gov/ps/ddwem/chemicals/AL/notificationoverview.pdf>

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U.S. Environmental Protection Agency (EPA)

2007 Letter to General Electric Company. June 8.

APPENDIX A

FIELD DATA LOG SHEETS

Well Number	HSU	TOC Elevationn (feet msl)	4th Q 2006 Date Measured	Groundwater Depth from TOC (feet)	Groundwater Elevation (feet msl)	1st Q 2007 Date Measured	Groundwater Depth from TOC (feet)
MW-1	NA	719.4	11/29/2006	239.48	479.92	3-22-07	222.18
MW-2	NA	720.04	NA	dry	dry	//	238.40
MW-3	NA	720.44	12/12/2006	239.82	480.62	//	237.55
MW-4	A	700.15	12/12/2006	226.2	473.95	//	223.10
MW-5	A	701.96	12/12/2006	227.84	474.12	//	224.49
MW-6	A	700.95	12/12/2006	226.56	474.39	//	223.48
MW-7	A	696.16	12/12/2006	224.25	471.91	//	220.96
MW-8	A	702.93	12/12/2006	229.98	472.95	//	226.50

Well Number	HSU	TOC Elevation (feet msl)	4th Q 2006 Date Measured	Groundwater Depth from TOC (feet)	Groundwater Elevation (feet msl)	2nd Q 2007 Date Measured	Groundwater Depth from TOC (feet)
MW-1	NA	719.4	11/29/2006	239.48	479.92	6-20	240.02
MW-2	NA	720.04	NA	dry	dry	6-20	ND
✓ MW-3	NA	720.44	12/11/2006	239.82	480.62	6-20	238.38
✓ MW-4	A*	700.15	12/12/2006	226.20	473.95	223.98	223.98
✓ MW-5	A*	701.96	12/12/2006	227.84	474.12	6-20	225.88
✓ MW-6	A*	700.95	12/12/2006	226.56	474.39	6-20	224.40
✓ MW-7	A*	696.16	12/11/2006	224.25	471.91	6-20	221.42
✓ MW-8	A*	702.93	12/11/2006	229.98	472.95	6-20	227.44

PAC WELLS SECOND QUARTER 2007 SAMPLING

Well ID	Hydro- stratigraphic Unit Screened	VOCs (EPA 8260B with freon and MTBE)	1,2,3- Trichloropropane (GC/MS Purge and Trap SIM)	Thallium EPA (6010B/7000) FILTERED	Total Cr (6010B) FILTERED	Chromium VI (EPA 218.6)	1,4-Dioxane (EPA 8270C-SIM)	Nitrate/(300.0)	DUPLICATE	REMARKS
		3 VOAs w/ HCl	3 VOAs w/ HCl	250 ml w/ HNO3	250 ml plastic /HNO3	125 ml plast unpres.	Two 40-ml VOA HCl	250 ml unpres		
MW-1		X	X	X	X	X	X	X		
MW-2		X	X	X	X	X	X	X		Been Dry
MW-3		X	X	X	X	X	X	X		6/26/07
MW-4		X	X	X	X	X	X	X		MS/MSD Triplicate
MW-5		X	X	X	X	X	X	X		6/25/07
MW-6		X	X	X	X	X	X	X		6/25/07
MW-7		X	X	X	X	X	X	X		6/25/07
MW-8		X	X	X	X	X	X	X	X	6/25/07
Duplicate1		X	X	X	X	X	X	X		
Trip1		X								
Trip2		X								
TOTAL		11	9	9	9	9	9	9		

PLUS one Duplicate per 10 samples and one Field Blank per day
MS/MSD = collect triplicates every 20 samples

MS/MSD
6/25/07

6



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DAILY REPORT

Date: 6/20/07

DAY

S M W TH F S

PROJECT Bou GW measurement.
JOB NO. 20113-01
Location/Building Burbank, CA.

WEATHER	Bright Sun	Clear	Overcast	Rain	Snow
TEMP.	To 32 °F	32-60	60-70	70-85	85 up
WIND	Stilt	Moderate	High		
HUMIDITY	Dry	Moderate	Humid		

Summary GW level measurement.

Samples Collected

Remarks

Visitors

Time

Name

Representing

Remarks

Equipment at Site

Work Activities

0700 - Arrived at A-1-NORTH with Tony Hernandez.
- prepare to go out and continue GW level measurement.
- Set out to call various entity for access to property for gauging.
- met metrolink flagman for gauging in R.R.
0830 - finished gauging 3 wells in R.R. went to Praxair to pick up nitrogen gas regulator that was serviced. Also pick up one nitrogen gas bottle from Air gas. Praxair air doesn't have the 99.998 purity on hand. Bought the bottle and refill is \$34. just take the empty bottle and exchange for another bottle.
0930 Set out to do VO wells and remaining wells
1230 Went to do PAC wells.



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DAILY REPORT

Date: 6/20/07

S	M	T	W	TH	F	S
			<input checked="" type="checkbox"/>			

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CUSTOMER: LMT TC NO.: 20113-01 LOCATION: Bow
Type of Work: GW gauging

Summary of Work Activities

1400 Back to A-1 North yard to prepare for tomorrow GW purging and sampling. Gather around all the tools and supplies needed.

1500 Pick up the Ford F250 rental truck from United Rental.

1530 Return to A-1 North and left site.

By: Norman Ng Title: Field Tech



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WELL PURGING FORMDate: 6/25/07TC# 20113-01Page 1 of 1Location Burbank Operable UnitClient Lockheed Martin CorporationSampler: NORMAN NGPAC WELL

Well ID: <u>MW-4</u>	Well Diameter: <u>4 or 6 inches</u>	Depth-to-Water (TOC): <u>224.00</u>
Gauging Date: <u>6/20/07</u>	Purging Method: <u>Sub. pump</u>	Depth-to-Bottom (TOC): <u>264.50</u>
Purging Date: <u>6/25/07</u>	Sampling Method: <u>Bailer or Pump</u>	Water Column (ft): <u>40.50</u>
Sampling Date: <u>6/25/07</u>		TOC to ground surface (ft): _____
Water Meter Instrument: <u>Horiba U-10</u>	<u>3/4 hp / 230V</u>	TOC = top of casing (at notch/mark)
Headspace Reading (ppm): <u>0</u>	<u>NO start by purge intake</u>	<u>245'</u>

WELL PURGING:

Calculate volume of water to purge:

28 gals X 3 vols = 84 gals

(1 casing volume)

(no. of volumes to purge)

(total volume to purge)

Note: water column x multiplier = casing volume

Well Diameter	Multiplier
1 inch	0.04
2 inch	0.16
3 inch	0.37
<u>4 inch</u>	0.65
6 inch	1.47
Other	radius (squared) x 0.163

TIME	TEMP (DEG C°)	EC mS/cm	pH	TURBIDITY (NTU)	SALINITY % or ppt	DO mg/L or	TOTAL GAL. PURGED
1601	32.0	.95	7.11	102	0.04	7.53	0
1606	24.6	.808	7.10	30	0.03	10.52	15
1611	22.3	.895	7.09	11	0.03	10.99	30
1616	22.1	.822	7.07	4	0.03	10.94	45
1621	22.2	.824	7.00	5	0.03	10.72	60
1626	22.1	.827	6.98	2	0.03	10.87	75
1630	22.0	.827	6.98	1	0.03	10.91	85

Comments:

Flow rate 3 GPMSample time 1648



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WELL PURGING FORM

Date: 6/26/07

TC# 20113-01

Page 1 of

Location Burbank Operable Unit

Client Lockheed Martin Corporation

Sampler: Ng

PAC WELL

Well ID: <u>MW-3</u>	Well Diameter: <u>4 or 6 inches</u>	Depth-to-Water (TOC): <u>238.38</u>
Gauging Date: <u>6-20-07</u>	Purging Method: <u>Sub. pump</u>	Depth-to-Bottom (TOC): <u>284.50</u>
Purging Date: <u>6-26-07</u>	Sampling Method: <u>Bailer or Pump</u>	Water Column (ft): <u>46.12</u>
Sampling Date: <u>6-26-07</u>	<u>3/4 hp / 230V</u>	TOC to ground surface (ft): <u> </u>
Water Meter Instrument: <u>Horiba 470</u>	<u>no starter box.</u>	TOC = top of casing (at notch/mark)
Headspace Reading (ppm) <u>0</u>		

WELL PURGING:

Calculate volume of water to purge:

30 gals X 3 vols = 90 gals

(1 casing volume)

(no. of volumes to purge)

(total volume to purge)

Note: water column x multiplier = casing volume

Well Diameter	Multiplier
1 inch	0.04
2 inch	0.16
3 inch	0.37
<u>4 inch</u>	0.65
6 inch	1.47
Other	radius (squared) x 0.163

TIME	TEMP (DEG C°)	EC mS/cm	pH	TURBIDITY (NTU)	SALINITY % or ppt	DO mg/L or	TOTAL GAL. PURGED
1411	36.3	1.00	6.79	184	0.04	8.32	6
1416	24.5	0.960	7.07	40	0.04	11.71	15
1421	22.9	0.971	7.08	22	0.04	10.98	30
1426	22.3	0.970	7.06	7	0.04	10.91	45
1431	22.2	.864	6.98	8	0.04	10.55	60
1436	22.0	.863	6.97	5	0.04	10.41	75
1441	22.0	.859	6.96	5	0.04	10.31	90
1449	Sample						

Comments:

Purge intake 262'
Flow rate 3 GPM



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WELL PURGING FORMDate: 6/26/07TC# 20113-01Page 1 of 1Location Burbank Operable UnitClient Lockheed Martin Corporation

Sampler: _____

PAC WELL

Well ID: <u>MW-5</u>	Well Diameter: <u>4 or 6 inches</u>	Depth-to-Water (TOC): <u>225.88</u>
Gauging Date: <u>6-20-07</u>	Purging Method: <u>Sub. Pump</u>	Depth-to-Bottom (TOC): <u>269.50</u>
Purging Date: <u>6-26-07</u>	Sampling Method: <u>Bailer or Pump</u>	Water Column (ft): <u>44</u>
Sampling Date: <u>6-26-07</u>	<u>3/4 hp</u>	TOC to ground surface (ft): _____
Water Meter Instrument: <u>Horiba u-10</u>	<u>230 V</u>	TOC = top of casing (at notch/mark)
Headspace Reading (ppm) <u>0</u>	<u>no standard box</u>	

WELL PURGING:

Calculate volume of water to purge:

28.6 gals x 3 vols = 86 gals

(1 casing volume)

(no. of volumes to purge)

(total volume to purge)

Note: water column x multiplier = casing volume

Well Diameter	Multiplier
1 inch	0.04
2 inch	0.16
3 inch	0.37
<u>4 inch</u>	<u>0.65</u>
6 inch	1.47
Other	radius (squared) x 0.163

TIME	TEMP (DEG C°)	EC mS/cm	pH	TURBIDITY (NTU)	SALINITY % or ppt	DO mg/L or	TOTAL GAL. PURGED
<u>1008</u>	<u>28.7</u>	<u>0.97</u>	<u>7.10</u>	<u>29</u>	<u>0.04</u>	<u>8.07</u>	<u>2</u>
<u>1013</u>	<u>22.0</u>	<u>0.831</u>	<u>7.08</u>	<u>44</u>	<u>0.04</u>	<u>10.17</u>	<u>15</u>
<u>1018</u>	<u>21.7</u>	<u>0.930</u>	<u>7.02</u>	<u>27</u>	<u>0.04</u>	<u>10.30</u>	<u>30</u>
<u>1023</u>	<u>21.2</u>	<u>0.930</u>	<u>7.05</u>	<u>18</u>	<u>0.04</u>	<u>10.33</u>	<u>45</u>
<u>1028</u>	<u>21.3</u>	<u>0.930</u>	<u>7.06</u>	<u>9</u>	<u>0.04</u>	<u>10.49</u>	<u>60</u>
<u>1033</u>	<u>21.6</u>	<u>0.930</u>	<u>7.02</u>	<u>8</u>	<u>0.04</u>	<u>10.60</u>	<u>75</u>
<u>1037</u>	<u>21.9</u>	<u>0.930</u>	<u>7.01</u>	<u>5</u>	<u>0.04</u>	<u>10.76</u>	<u>87</u>
<u>1041</u>	<u>21.8</u>	<u>0.930</u>	<u>7.01</u>	<u>4</u>	<u>0.04</u>	<u>10.48</u>	<u>99</u>
<u>1045</u>	<u>Sample.</u>						

Comments:

Purge intake 243' , Flow rate 3 gpm



Tetra Tech, Inc.
3475 E. Foothill Blvd.
Pasadena, CA 91107
(626) 351-4664
Fax (626) 351-5291

WELL PURGING FORM

Date: 6/26/07

TC# 20113-01

Page 1 of 1

Location Burbank Operable Unit

Client Lockheed Martin Corporation

Sampler: Ng

PAC WELL

Well ID: <u>MW-6</u>	Well Diameter: <u>4 or 6 inches</u>	Depth-to-Water (TOC): <u>224.40</u>
Gauging Date: <u>6/20/07</u>	Purging Method: <u>Sub Pump</u>	Depth-to-Bottom (TOC): <u>265.00</u>
Purging Date: <u>6/26/07</u>	Sampling Method: <u>Bailer or Pump</u>	Water Column (ft): <u>40.60</u>
Sampling Date: <u>6/26/07</u>		TOC to ground surface (ft): _____
Water Meter Instrument: <u>Horiba U-10</u>	<u>3/4 hp</u>	TOC = top of casing (at notch/mark)
Headspace Reading (ppm) <u>2</u>	<u>230 v.</u>	
	<u>no stander box</u>	

WELL PURGING:

Calculate volume of water to purge:

26.50 gals X 3 vols = 80 gals

(1 casing volume)

(no. of volumes to purge)

(total volume to purge)

Note: water column x multiplier = casing volume

Well Diameter

Multiplier

1 inch	0.04
2 inch	0.16
3 inch	0.37
<u>4 inch</u>	0.65
6 inch	1.47
Other	radius (squared) x 0.163

TIME	TEMP (DEG C°)	EC mS/cm	pH	TURBIDITY (NTU)	SALINITY (% or ppt)	DO mg/L or	TOTAL GAL. PURGED
1210	33.7	0.960	7.11	187	0.04	7.18	0
1214	23.1	0.806	7.10	122	0.03	10.37	12
1218	22.3	0.812	7.08	47	0.03	11.01	24
1222	22.1	0.815	7.05	10	0.03	10.67	36
1226	22.0	0.818	7.04	7	0.03	10.70	48
1230	22.6	0.816	6.97	6	0.03	10.33	60
1234	22.7	0.817	6.99	5	0.03	10.35	72
1237	22.4	0.818	6.98	4	0.03	10.22	80
1241	Sample time.						

Comments:

Flow Rate - 39 gpm
Purge Intake - 242'



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Fax (626) 351-5291

WELL PURGING FORM

Date: 6/25/07

TC# 20113-01

Page 1 of 1

Location Burbank Operable Unit

Client Lockheed Martin Corporation

Sampler: Ng

PAC WELL

Well ID: MW-7 Well Diameter: 4 or 6 inches Depth-to-Water (TOC): 221.42
Gauging Date: 6-20-07 Purging Method: Sub. Pump Depth-to-Bottom (TOC): 260.00
Purging Date: 6-25-07 Sampling Method: Bailer or Pump Water Column (ft): 38.58
Sampling Date: 6-25-07 TOC to ground surface (ft): _____
Water Meter Instrument: Horiba TOC = top of casing (at notch/mark)
Headspace Reading (ppm) 8 Purge intake 240
3/4 hp / 230V No starter box

WELL PURGING:

Calculate volume of water to purge:

25.35 gals X 3 vols = 76 gals

(1 casing volume) (no. of volumes to purge) (total volume to purge)

Note: water column x multiplier = casing volume

Well Diameter	Multiplier
1 inch	0.04
2 inch	0.16
3 inch	0.37
<u>4 inch</u>	0.65
6 inch	1.47
Other	radius (squared) x 0.163

TIME	TEMP (DEG C°)	EC mS/cm	pH	TURBIDITY (NTU)	SALINITY % or ppt	DO mg/L or	TOTAL GAL. PURGED
<u>1341</u>	<u>33.1</u>	<u>0.94</u>	<u>7.40</u>	<u>113</u>	<u>0.04</u>	<u>8.58</u>	<u>0</u>
<u>1345</u>	<u>23.3</u>	<u>.802</u>	<u>7.38</u>	<u>157</u>	<u>0.03</u>	<u>12.16</u>	<u>12</u>
<u>1354</u>	<u>21.9</u>	<u>.805</u>	<u>7.27</u>	<u>175</u>	<u>0.03</u>	<u>12.06</u>	<u>24</u>
<u>1358</u>	<u>21.8</u>	<u>.815</u>	<u>6.98</u>	<u>71</u>	<u>0.03</u>	<u>11.61</u>	<u>36</u>
<u>1402</u>	<u>21.4</u>	<u>.816</u>	<u>6.95</u>	<u>24</u>	<u>0.03</u>	<u>11.64</u>	<u>48</u>
<u>1406</u>	<u>21.6</u>	<u>.815</u>	<u>6.91</u>	<u>10</u>	<u>0.03</u>	<u>11.12</u>	<u>60</u>
<u>1410</u>	<u>21.7</u>	<u>.818</u>	<u>6.89</u>	<u>5</u>	<u>0.03</u>	<u>10.87</u>	<u>72</u>
<u>1414</u>	<u>21.8</u>	<u>.821</u>	<u>6.88</u>	<u>1</u>	<u>0.03</u>	<u>10.84</u>	<u>76</u>

Comments:

1345 - Redo the tap with our S.S. Tap.
WDC has just steel tap.



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WELL PURGING FORM

Date: 6/26/07

TC# 20113-01

Page 1 of 1

Location Burbank Operable Unit

Client Lockheed Martin Corporation

Sampler: Ng

PAC WELL

Well ID: <u>MW-8</u>	Well Diameter: <u>4 or 6 inches</u>	Depth-to-Water (TOC): <u>227.44</u>
Gauging Date: <u>6-20-07</u>	Purging Method: <u>Sub. pump</u>	Depth-to-Bottom (TOC): <u>268.00</u>
Purging Date: <u>6-26-07</u>	Sampling Method: <u>Bailer or Pump</u>	Water Column (ft): <u>40.56</u>
Sampling Date: <u>6-26-07</u>	<u>3/4 hp</u>	TOC to ground surface (ft): <u> </u>
Water Meter Instrument: <u>Horiba U-10</u>	<u>250 V</u>	TOC = top of casing (at notch/mark)
Headspace Reading (ppm): <u>0</u>	<u>no start box</u>	

WELL PURGING:

Calculate volume of water to purge:

26.65 gals X 3 vols = 80 gals

(1 casing volume)

(no. of volumes to purge)

(total volume to purge)

Note: water column x multiplier = casing volume

Well Diameter

Multiplier

1 inch	0.04
2 inch	0.16
3 inch	0.37
4 inch	0.65
6 inch	1.47
Other	radius (squared) x 0.163

TIME	TEMP (DEG C°)	EC mS/cm	pH	TURBIDITY (NTU)	SALINITY (% or ppt)	DO (mg/L or)	TOTAL GAL. PURGED
0755	22.5	0.962	6.99	227	0.04	8.66	0
0800	20.5	0.827	7.03	60	0.03	9.75	12
0805	20.7	0.933	7.00	21	0.04	9.62	24
0810	20.9	0.930	7.03	13	0.04	9.72	36
0815	20.9	0.930	7.02	7	0.04	9.78	48
0820	21.0	0.930	7.00	5	0.04	9.82	60
0825	21.1	0.930	7.01	2	0.04	9.87	72
0828	21.1	0.930	7.01	2	0.04	9.88	80

Comments:

Flow rate - 3 gpm, Purge intake 245

Duplicate sample - I.D. (MW-9)

Sample MW8-0830

Time MW9-0950

SEPTEMBER 2007 WATER LEVEL MEASUREMENTS

Well ID	Hydro-stratigraphic Unit Screened	Measuring Point Elevation (feet MSL)	MAR 2007 Depth to Water (feet)	JUN 2007 Depth to Water (feet)	Date Measured	Time Measured	SEPT 2007 Depth to Water (feet)	Current Well Conditions
V01A	wt	614.93	147.60	149.50	9-26-07	0930	149.80	60 PSI → 115
V01B	B	614.93	152.15	158.36		0935	153.35	60 PSI → 115
V02A	wt	619.31	157.55	174.66		0950	155.35	80 PSI → 100
V02B	B	619.31	157.40	172.23		0954	160.70	80 PSI → 100
V03A	wt	626.12	173.56	176.95		1007	175.90	105 PSI -
V03B	B	626.12	175.57	183.85		1010	178.00	105 PSI -
V04A	wt	637.06	169.60	195.95		1030	171.75	40 PSI
V04B	B	637.06	180.70	152.78		1035		40 PSI
V05A	wt	643.27	174.92	158.15	9-26-07	0620	178.62	110 PSI
V05B	B	643.27	181.24	176.48	9-26-07	0625	185.00	110 PSI
V06A	wt	654.01	187.54	180.02		0640	186.20	water level not steady, concx bad
V06B	B	654.01	183.75	183.30		0645	195.32	water level not steady
V07A	wt	666.43	194.05	197.40		0700	197.90	110 PSI
V07B	B	666.43	205.95	211.81		0705	214.11	110 PSI
V08	wt	646.57	204.05	212.21	9/24/07	1310	218.70	pump is on, water level is going down
PAC WELLS								
MW-1				240.02	9-26-07	1400	240.21	
MW-2				ND	9-26-07	1415	N/A	DRY 256'
MW-3				238.38	9-26-07	1410	240.55	
MW-4				223.98	9-26-07	1338	226.11	CAP IS NOT tight, surface water heat in
MW-5				225.88	9-26-07	1320	228.01	
MW-6				224.4	9-26-07	1348	226.55	
MW-7				221.42	9-26-07	1302	223.97	
MW-8				227.44	9-26-07	1310	229.60	

* MW-4 is the low spot of the property. any rain fall will form a pond at mw-4. The well cap for MW-4 need to be tighten to prevent surface water from going into the well. Jimmy please tell all parties that check that well about this problem.

** V06 - concrete ~~well~~ around the well broken and Burbank city official hint of the need to repair it.

APPENDIX B

LABORATORY ANALYTICAL DATA REPORTS



American Environmental Testing Laboratory Inc.

2834 & 2908 North Naomi Street Burbank, CA 91504 • DOHS NO: 1541, LACSD NO: 10181
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Tetra Tech, Inc.
3475 East Foothill Boulevard
Pasadena, CA 91107-6024

Telephone: (626) 351-4664
Attention: Robert Sabater

Number of Pages 18

Date Received 06/26/2007

Date Reported 07/25/2007

Job Number	Order Date	Client
42893	06/26/2007	T/T

Project ID: 20114-01
Project Name: PAC WELLS
Site: PAC Wells
Lockheed Martin Corp.

Enclosed please find results of analyses of 8 water samples which were analyzed as specified on the attached chain of custody. If there are any questions, please do not hesitate to call.

Checked By: _____

Approved By: _____

C. Razmara

Cyrus Razmara, Ph.D.
Laboratory Director



**3475 E. Foothill Boulevard
Pasadena, California 91107
Telephone: (626) 351-4664
Fax: (626) 351-5291**

Vol # 42893

Shipped to: American Environmental Testing Laboratory, Inc. (AETL)
2834 North Naomi Street, Burbank, CA 91504
Phone: 800-288-2385
Dr. Cyrus or Jim Lin

CHAIN OF CUSTODY RECORD

Date: 6, 26, 07 PAGE 1 OF 1

[illegible]



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ANALYTICAL RESULTS

Ordered By

Site

Tetra Tech, Inc.
3475 East Foothill Boulevard
Pasadena, CA 91107-6024

PAC Wells
Lockheed Martin Corp.

Telephone: (626)351-4664

Attn: Robert Sabater

Page: 2

Project ID: 20114-01

Project Name: PAC WELLS

AETL Job Number	Submitted	Client
42893	06/26/2007	T/T

Method: 8260B, Volatile Organic Compounds by GC/MS (SW846)

QC Batch No: 062807

Our Lab I.D.			Method Blank	42893.01	42893.02	42893.03
Client Sample I.D.				PAC 062607 TB	MW-8	MW-9
Date Sampled				06/26/2007	06/26/2007	06/26/2007
Date Prepared			06/28/2007	06/28/2007	06/28/2007	06/28/2007
Preparation Method			5030B	5030B	5030B	5030B
Date Analyzed			06/28/2007	06/28/2007	06/28/2007	06/28/2007
Matrix			Aqueous	Aqueous	Aqueous	Aqueous
Units			ug/L	ug/L	ug/L	ug/L
Dilution Factor			1	1	1	1
Analytes	MDL	PQL	Results	Results	Results	Results
Acetone	10.0	25.0	ND	ND	ND	ND
Benzene	0.20	0.50	ND	ND	ND	ND
Bromobenzene (Phenyl bromide)	0.50	1.00	ND	ND	ND	ND
Bromochloromethane	0.50	1.00	ND	ND	ND	ND
Bromodichloromethane	0.50	1.00	ND	ND	ND	ND
Bromoform (Tribromomethane)	0.50	1.00	ND	ND	ND	ND
Bromomethane (Methyl bromide)	1.50	3.00	ND	ND	ND	ND
2-Butanone (MEK)	2.50	5.00	ND	ND	ND	ND
n-Butylbenzene	0.50	1.00	ND	ND	ND	ND
sec-Butylbenzene	0.50	1.00	ND	ND	ND	ND
tert-Butylbenzene	0.50	1.00	ND	ND	ND	ND
Carbon Disulfide	0.50	5.00	ND	ND	ND	ND
Carbon tetrachloride	0.20	0.50	ND	ND	1.60	1.60
Chlorobenzene	0.50	1.00	ND	ND	ND	ND
Chloroethane	0.50	1.00	ND	ND	ND	ND
2-Chloroethyl vinyl ether	2.50	5.00	ND	ND	ND	ND
Chloroform (Trichloromethane)	0.50	1.00	ND	ND	1.40	1.30
Chloromethane (Methyl chloride)	1.50	5.00	ND	ND	ND	ND
2-Chlorotoluene	0.50	1.00	ND	ND	ND	ND
4-Chlorotoluene	0.50	1.00	ND	ND	ND	ND
1,2-Dibromo-3-chloropropane (DBCP)	2.50	5.00	ND	ND	ND	ND
Dibromochloromethane	0.50	1.00	ND	ND	ND	ND
1,2-Dibromoethane (EDB)	0.50	1.00	ND	ND	ND	ND
Dibromomethane	0.50	1.00	ND	ND	ND	ND
1,2-Dichlorobenzene	0.50	1.00	ND	ND	ND	ND
1,3-Dichlorobenzene	0.50	1.00	ND	ND	ND	ND
1,4-Dichlorobenzene	0.50	1.00	ND	ND	ND	ND



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ANALYTICAL RESULTS

Page: 3

Project ID: 20114-01
Project Name: PAC WELLS

AETL Job Number	Submitted	Client
42893	06/26/2007	T/T

Method: 8260B, Volatile Organic Compounds by GC/MS (SW846)

QC Batch No: 062807

Our Lab I.D.		Method	Blank	42893.01	42893.02	42893.03
Client Sample I.D.				PAC 062607 TB	MW-8	MW-9
Date Sampled				06/26/2007	06/26/2007	06/26/2007
Date Prepared			06/28/2007	06/28/2007	06/28/2007	06/28/2007
Preparation Method			5030B	5030B	5030B	5030B
Date Analyzed			06/28/2007	06/28/2007	06/28/2007	06/28/2007
Matrix			Aqueous	Aqueous	Aqueous	Aqueous
Units			ug/L	ug/L	ug/L	ug/L
Dilution Factor			1	1	1	1
Analytes	MDL	PQL	Results	Results	Results	Results
Dichlorodifluoromethane	0.50	1.00	ND	ND	ND	ND
1,1-Dichloroethane	0.50	1.00	ND	ND	ND	ND
1,2-Dichloroethane (EDC)	0.50	1.00	ND	ND	1.60	1.50
1,1-Dichloroethene	0.50	1.00	ND	ND	2.80	2.50
cis-1,2-Dichloroethene	0.50	1.00	ND	ND	ND	ND
trans-1,2-Dichloroethene	0.50	1.00	ND	ND	ND	ND
1,2-Dichloropropane	0.50	1.00	ND	ND	ND	ND
1,3-Dichloropropane	0.50	1.00	ND	ND	ND	ND
2,2-Dichloropropane	0.50	1.00	ND	ND	ND	ND
1,1-Dichloropropene	0.50	1.00	ND	ND	ND	ND
cis-1,3-Dichloropropene	0.20	0.50	ND	ND	ND	ND
trans-1,3-Dichloropropene	0.20	0.50	ND	ND	ND	ND
Ethylbenzene	0.50	1.00	ND	ND	ND	ND
Hexachlorobutadiene	1.50	3.00	ND	ND	ND	ND
2-Hexanone	2.50	5.00	ND	ND	ND	ND
Isopropylbenzene	0.50	1.00	ND	ND	ND	ND
p-Isopropyltoluene	0.50	1.00	ND	ND	ND	ND
4-Methyl-2-pentanone (MIBK)	2.50	5.00	ND	ND	ND	ND
Methyl-tert-butyl ether (MTBE)	0.50	1.00	ND	ND	ND	ND
Methylene chloride (DCM)	2.00	4.00	ND	ND	ND	ND
Naphthalene	0.50	1.00	ND	ND	ND	ND
n-Propylbenzene	0.50	1.00	ND	ND	ND	ND
Styrene	0.50	1.00	ND	ND	ND	ND
1,1,1,2-Tetrachloroethane	0.50	1.00	ND	ND	ND	ND
1,1,2,2-Tetrachloroethane	0.50	1.00	ND	ND	ND	ND
Tetrachloroethene	0.50	1.00	ND	ND	170	163
Toluene (Methyl benzene)	0.50	1.00	ND	ND	ND	ND
1,1,2-Trichloro-1,2,2-trifluoroethane	1.00	5.00	ND	ND	1.66J	ND
1,2,3-Trichlorobenzene	0.50	1.00	ND	ND	ND	ND
1,2,4-Trichlorobenzene	0.50	1.00	ND	ND	ND	ND
1,1,1-Trichloroethane	0.50	1.00	ND	ND	ND	ND
1,1,2-Trichloroethane	0.50	1.00	ND	ND	ND	ND
Trichloroethene	0.50	1.00	ND	ND	59.7	58.9



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ANALYTICAL RESULTS

Page: 4

Project ID: 20114-01
Project Name: PAC WELLS

AETL Job Number	Submitted	Client
42893	06/26/2007	T/T

Method: 8260B, Volatile Organic Compounds by GC/MS (SW846)

QC Batch No: 062807

Our Lab I.D.			Method Blank	42893.01	42893.02	42893.03
Client Sample I.D.				PAC 062607 TB	MW-8	MW-9
Date Sampled				06/26/2007	06/26/2007	06/26/2007
Date Prepared			06/28/2007	06/28/2007	06/28/2007	06/28/2007
Preparation Method			5030B	5030B	5030B	5030B
Date Analyzed			06/28/2007	06/28/2007	06/28/2007	06/28/2007
Matrix			Aqueous	Aqueous	Aqueous	Aqueous
Units			ug/L	ug/L	ug/L	ug/L
Dilution Factor			1	1	1	1
Analytes	MDL	PQL	Results	Results	Results	Results
Trichlorofluoromethane	0.50	1.00	ND	ND	ND	ND
1,2,3-Trichloropropane	0.50	1.00	ND	ND	ND	ND
1,2,4-Trimethylbenzene	0.50	1.00	ND	ND	ND	ND
1,3,5-Trimethylbenzene	0.50	1.00	ND	ND	ND	ND
Vinyl Acetate	0.50	5.00	ND	ND	ND	ND
Vinyl chloride (Chloroethene)	0.20	0.50	ND	ND	ND	ND
o-Xylene	0.50	1.00	ND	ND	ND	ND
m,p-Xylenes	0.50	1.00	ND	ND	ND	ND
Our Lab I.D.			Method Blank	42893.01	42893.02	42893.03
Surrogates	%Rec.Limit		% Rec.	% Rec.	% Rec.	% Rec.
Bromofluorobenzene	75-125		110	111	109	112
Dibromofluoromethane	75-125		103	104	108	100
Toluene-d8	75-125		105	107	106	105



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ANALYTICAL RESULTS

Ordered By

Site

Tetra Tech, Inc.
3475 East Foothill Boulevard
Pasadena, CA 91107-6024

PAC Wells
Lockheed Martin Corp.

Telephone: (626)351-4664

Attn: Robert Sabater

Page: 5

Project ID: 20114-01

Project Name: PAC WELLS

AETL Job Number	Submitted	Client
42893	06/26/2007	T/T

Method: 8260B, Volatile Organic Compounds by GC/MS (SW846)

QC Batch No: 062807

Our Lab I.D.			42893.04	42893.05	42893.06	42893.07
Client Sample I.D.			MW-5	MW-6	MW-3	PAC 062607 FB
Date Sampled			06/26/2007	06/26/2007	06/26/2007	06/26/2007
Date Prepared			06/28/2007	06/28/2007	06/28/2007	06/28/2007
Preparation Method			5030B	5030B	5030B	5030B
Date Analyzed			06/28/2007	06/28/2007	06/28/2007	06/28/2007
Matrix			Aqueous	Aqueous	Aqueous	Aqueous
Units			ug/L	ug/L	ug/L	ug/L
Dilution Factor			1	1	1	1
Analytes	MDL	PQL	Results	Results	Results	Results
Acetone	10.0	25.0	ND	ND	ND	ND
Benzene	0.20	0.50	ND	ND	ND	ND
Bromobenzene (Phenyl bromide)	0.50	1.00	ND	ND	ND	ND
Bromochloromethane	0.50	1.00	ND	ND	ND	ND
Bromodichloromethane	0.50	1.00	ND	ND	ND	ND
Bromoform (Tribromomethane)	0.50	1.00	ND	ND	ND	ND
Bromomethane (Methyl bromide)	1.50	3.00	ND	ND	ND	ND
2-Butanone (MEK)	2.50	5.00	ND	ND	ND	ND
n-Butylbenzene	0.50	1.00	ND	ND	ND	ND
sec-Butylbenzene	0.50	1.00	ND	ND	ND	ND
tert-Butylbenzene	0.50	1.00	ND	ND	ND	ND
Carbon Disulfide	0.50	5.00	ND	ND	ND	ND
Carbon tetrachloride	0.20	0.50	1.90	1.60	1.10	ND
Chlorobenzene	0.50	1.00	ND	ND	ND	ND
Chloroethane	0.50	1.00	ND	ND	ND	ND
2-Chloroethyl vinyl ether	2.50	5.00	ND	ND	ND	ND
Chloroform (Trichloromethane)	0.50	1.00	2.20	2.10	2.90	ND
Chloromethane (Methyl chloride)	1.50	5.00	ND	ND	ND	ND
2-Chlorotoluene	0.50	1.00	ND	ND	ND	ND
4-Chlorotoluene	0.50	1.00	ND	ND	ND	ND
1,2-Dibromo-3-chloropropane (DBCP)	2.50	5.00	ND	ND	ND	ND
Dibromochloromethane	0.50	1.00	ND	ND	ND	ND
1,2-Dibromoethane (EDB)	0.50	1.00	ND	ND	ND	ND
Dibromomethane	0.50	1.00	ND	ND	ND	ND
1,2-Dichlorobenzene	0.50	1.00	ND	ND	ND	ND
1,3-Dichlorobenzene	0.50	1.00	ND	ND	ND	ND
1,4-Dichlorobenzene	0.50	1.00	ND	ND	ND	ND



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ANALYTICAL RESULTS

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Project ID: 20114-01
Project Name: PAC WELLS

AETL Job Number	Submitted	Client
42893	06/26/2007	T/T

Method: 8260B, Volatile Organic Compounds by GC/MS (SW846)

QC Batch No: 062807

Our Lab I.D.			42893.04	42893.05	42893.06	42893.07	
Client Sample I.D.			MW-5	MW-6	MW-3	PAC 062607 FB	
Date Sampled			06/26/2007	06/26/2007	06/26/2007	06/26/2007	
Date Prepared			06/28/2007	06/28/2007	06/28/2007	06/28/2007	
Preparation Method			5030B	5030B	5030B	5030B	
Date Analyzed			06/28/2007	06/28/2007	06/28/2007	06/28/2007	
Matrix			Aqueous	Aqueous	Aqueous	Aqueous	
Units			ug/L	ug/L	ug/L	ug/L	
Dilution Factor			1	1	1	1	
Analytes	MDL	PQL	Results	Results	Results	Results	
Dichlorodifluoromethane	0.50	1.00	ND	ND	ND	ND	
1,1-Dichloroethane	0.50	1.00	ND	ND	ND	ND	
1,2-Dichloroethane (EDC)	0.50	1.00	0.68J	ND	1.30	ND	
1,1-Dichloroethene	0.50	1.00	6.22	6.30	12.1	ND	
cis-1,2-Dichloroethene	0.50	1.00	ND	ND	ND	ND	
trans-1,2-Dichloroethene	0.50	1.00	ND	ND	ND	ND	
1,2-Dichloropropane	0.50	1.00	ND	ND	ND	ND	
1,3-Dichloropropane	0.50	1.00	ND	ND	ND	ND	
2,2-Dichloropropane	0.50	1.00	ND	ND	ND	ND	
1,1-Dichloropropene	0.50	1.00	ND	ND	ND	ND	
cis-1,3-Dichloropropene	0.20	0.50	ND	ND	ND	ND	
trans-1,3-Dichloropropene	0.20	0.50	ND	ND	ND	ND	
Ethylbenzene	0.50	1.00	ND	ND	ND	ND	
Hexachlorobutadiene	1.50	3.00	ND	ND	ND	ND	
2-Hexanone	2.50	5.00	ND	ND	ND	ND	
Isopropylbenzene	0.50	1.00	ND	ND	ND	ND	
p-Isopropyltoluene	0.50	1.00	ND	ND	ND	ND	
4-Methyl-2-pentanone (MIBK)	2.50	5.00	ND	ND	ND	ND	
Methyl-tert-butyl ether (MTBE)	0.50	1.00	ND	ND	ND	ND	
Methylene chloride (DCM)	2.00	4.00	ND	ND	ND	ND	
Naphthalene	0.50	1.00	ND	ND	ND	ND	
n-Propylbenzene	0.50	1.00	ND	ND	ND	ND	
Styrene	0.50	1.00	ND	ND	ND	ND	
1,1,1,2-Tetrachloroethane	0.50	1.00	ND	ND	ND	ND	
1,1,2,2-Tetrachloroethane	0.50	1.00	ND	ND	ND	ND	
Tetrachloroethene	0.50	1.00	136	105	143	ND	
Toluene (Methyl benzene)	0.50	1.00	ND	ND	ND	ND	
1,1,2-Trichloro-1,2,2-trifluoroethane	1.00	5.00	2.89J	1.85J	6.83	ND	
1,2,3-Trichlorobenzene	0.50	1.00	ND	ND	ND	ND	
1,2,4-Trichlorobenzene	0.50	1.00	ND	ND	ND	ND	
1,1,1-Trichloroethane	0.50	1.00	0.60J	0.60J	1.10	ND	
1,1,2-Trichloroethane	0.50	1.00	ND	ND	ND	ND	
Trichloroethene	0.50	1.00	52.3	37.4	38.2	ND	



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ANALYTICAL RESULTS

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Project ID: 20114-01
Project Name: PAC WELLS

AETL Job Number	Submitted	Client
42893	06/26/2007	T/T

Method: 8260B, Volatile Organic Compounds by GC/MS (SW846)

QC Batch No: 062807

Our Lab I.D.		42893.04	42893.05	42893.06	42893.07	
Client Sample I.D.		MW-5	MW-6	MW-3	PAC 062607 FB	
Date Sampled		06/26/2007	06/26/2007	06/26/2007	06/26/2007	
Date Prepared		06/28/2007	06/28/2007	06/28/2007	06/28/2007	
Preparation Method		5030B	5030B	5030B	5030B	
Date Analyzed		06/28/2007	06/28/2007	06/28/2007	06/28/2007	
Matrix		Aqueous	Aqueous	Aqueous	Aqueous	
Units		ug/L	ug/L	ug/L	ug/L	
Dilution Factor		1	1	1	1	
Analytes	MDL	PQL	Results	Results	Results	Results
Trichlorofluoromethane	0.50	1.00	ND	ND	ND	ND
1,2,3-Trichloropropane	0.50	1.00	ND	ND	1.60	ND
1,2,4-Trimethylbenzene	0.50	1.00	ND	ND	ND	ND
1,3,5-Trimethylbenzene	0.50	1.00	ND	ND	ND	ND
Vinyl Acetate	0.50	5.00	ND	ND	ND	ND
Vinyl chloride (Chloroethene)	0.20	0.50	ND	ND	ND	ND
o-Xylene	0.50	1.00	ND	ND	ND	ND
m,p-Xylenes	0.50	1.00	ND	ND	ND	ND
Our Lab I.D.		42893.04	42893.05	42893.06	42893.07	
Surrogates	%Rec.Limit	% Rec.	% Rec.	% Rec.	% Rec.	
Bromofluorobenzene	75-125	112	114	111	113	
Dibromofluoromethane	75-125	106	106	105	105	
Toluene-d8	75-125	105	105	104	106	



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Project ID: 20114-01

Project Name: PAC WELLS

AETL Job Number	Submitted	Client
42893	06/26/2007	T/T

Method: 8260B, Volatile Organic Compounds by GC/MS (SW846)

QC Batch No: 062807

Our Lab I.D.		42893.08	
Client Sample I.D.		MW-8 DUP	
Date Sampled		06/26/2007	
Date Prepared		06/28/2007	
Preparation Method		5030B	
Date Analyzed		06/28/2007	
Matrix		Aqueous	
Units		ug/L	
Dilution Factor		1	
Analytes	MDL	PQL	Results
Acetone	10.0	25.0	ND
Benzene	0.20	0.50	ND
Bromobenzene (Phenyl bromide)	0.50	1.00	ND
Bromochloromethane	0.50	1.00	ND
Bromodichloromethane	0.50	1.00	ND
Bromoform (Tribromomethane)	0.50	1.00	ND
Bromomethane (Methyl bromide)	1.50	3.00	ND
2-Butanone (MEK)	2.50	5.00	ND
n-Butylbenzene	0.50	1.00	ND
sec-Butylbenzene	0.50	1.00	ND
tert-Butylbenzene	0.50	1.00	ND
Carbon Disulfide	0.50	5.00	ND
Carbon tetrachloride	0.20	0.50	1.50
Chlorobenzene	0.50	1.00	ND
Chloroethane	0.50	1.00	ND
2-Chloroethyl vinyl ether	2.50	5.00	ND
Chloroform (Trichloromethane)	0.50	1.00	1.30
Chloromethane (Methyl chloride)	1.50	5.00	ND
2-Chlorotoluene	0.50	1.00	ND
4-Chlorotoluene	0.50	1.00	ND
1,2-Dibromo-3-chloropropane (DBCP)	2.50	5.00	ND
Dibromochloromethane	0.50	1.00	ND
1,2-Dibromoethane (EDB)	0.50	1.00	ND
Dibromomethane	0.50	1.00	ND
1,2-Dichlorobenzene	0.50	1.00	ND
1,3-Dichlorobenzene	0.50	1.00	ND
1,4-Dichlorobenzene	0.50	1.00	ND
Dichlorodifluoromethane	0.50	1.00	ND



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ANALYTICAL RESULTS

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Project ID: 20114-01
Project Name: PAC WELLS

AETL Job Number	Submitted	Client
42893	06/26/2007	T/T

Method: 8260B, Volatile Organic Compounds by GC/MS (SW846)

QC Batch No: 062807

Our Lab I.D.			42893.08			
Client Sample I.D.			MW-8 DUP			
Date Sampled			06/26/2007			
Date Prepared			06/28/2007			
Preparation Method			5030B			
Date Analyzed			06/28/2007			
Matrix			Aqueous			
Units			ug/L			
Dilution Factor			1			
Analytes	MDL	PQL	Results			
1,1-Dichloroethane	0.50	1.00	ND			
1,2-Dichloroethane (EDC)	0.50	1.00	1.60			
1,1-Dichloroethene	0.50	1.00	2.60			
cis-1,2-Dichloroethene	0.50	1.00	ND			
trans-1,2-Dichloroethene	0.50	1.00	ND			
1,2-Dichloropropane	0.50	1.00	ND			
1,3-Dichloropropane	0.50	1.00	ND			
2,2-Dichloropropane	0.50	1.00	ND			
1,1-Dichloropropene	0.50	1.00	ND			
cis-1,3-Dichloropropene	0.20	0.50	ND			
trans-1,3-Dichloropropene	0.20	0.50	ND			
Ethylbenzene	0.50	1.00	ND			
Hexachlorobutadiene	1.50	3.00	ND			
2-Hexanone	2.50	5.00	ND			
Isopropylbenzene	0.50	1.00	ND			
p-Isopropyltoluene	0.50	1.00	ND			
4-Methyl-2-pentanone (MIBK)	2.50	5.00	ND			
Methyl-tert-butyl ether (MTBE)	0.50	1.00	ND			
Methylene chloride (DCM)	2.00	4.00	ND			
Naphthalene	0.50	1.00	ND			
n-Propylbenzene	0.50	1.00	ND			
Styrene	0.50	1.00	ND			
1,1,1,2-Tetrachloroethane	0.50	1.00	ND			
1,1,2,2-Tetrachloroethane	0.50	1.00	ND			
Tetrachloroethene	0.50	1.00	162			
Toluene (Methyl benzene)	0.50	1.00	ND			
1,1,2-Trichloro-1,2,2-trifluoroethane	1.00	5.00	1.70J			
1,2,3-Trichlorobenzene	0.50	1.00	ND			
1,2,4-Trichlorobenzene	0.50	1.00	ND			
1,1,1-Trichloroethane	0.50	1.00	ND			
1,1,2-Trichloroethane	0.50	1.00	ND			
Trichloroethene	0.50	1.00	58.4			
Trichlorofluoromethane	0.50	1.00	ND			
1,2,3-Trichloropropane	0.50	1.00	ND			



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ANALYTICAL RESULTS

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Project ID: 20114-01
Project Name: PAC WELLS

AETL Job Number	Submitted	Client
42893	06/26/2007	T/T

Method: 8260B, Volatile Organic Compounds by GC/MS (SW846)

QC Batch No: 062807

Our Lab I.D.		42893.08				
Client Sample I.D.		MW-8 DUP				
Date Sampled		06/26/2007				
Date Prepared		06/28/2007				
Preparation Method		5030B				
Date Analyzed		06/28/2007				
Matrix		Aqueous				
Units		ug/L				
Dilution Factor		1				
Analytes	MDL	PQL	Results			
1,2,4-Trimethylbenzene	0.50	1.00	ND			
1,3,5-Trimethylbenzene	0.50	1.00	ND			
Vinyl Acetate	0.50	5.00	ND			
Vinyl chloride (Chloroethene)	0.20	0.50	ND			
o-Xylene	0.50	1.00	ND			
m,p-Xylenes	0.50	1.00	ND			
Our Lab I.D.		42893.08				
Surrogates	%Rec.Limit		% Rec.			
Bromofluorobenzene	75-125		112			
Dibromofluoromethane	75-125		107			
Toluene-d8	75-125		105			



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Project ID: 20114-01

Project Name: PAC WELLS

AETL Job Number	Submitted	Client
42893	06/26/2007	T/T

Method: 8260B-SIM, 1,2,3-TCP and 1,4-Dioxane by GC/MS SIM (8260B Modified)

QC Batch No: 062707

Our Lab I.D.			Method Blank	42893.02	42893.03	42893.04	42893.05
Client Sample I.D.				MW-8	MW-9	MW-5	MW-6
Date Sampled				06/26/2007	06/26/2007	06/26/2007	06/26/2007
Date Prepared			06/27/2007	06/27/2007	06/27/2007	06/27/2007	06/27/2007
Preparation Method			5030B	5030B	5030B	5030B	5030B
Date Analyzed			06/27/2007	06/27/2007	06/27/2007	06/27/2007	06/27/2007
Matrix			Aqueous	Aqueous	Aqueous	Aqueous	Aqueous
Units			ug/L	ug/L	ug/L	ug/L	ug/L
Dilution Factor			1	1	1	1	1
Analytes	MDL	PQL	Results	Results	Results	Results	Results
1,4-Dioxane	0.50	2.00	ND	ND	ND	ND	ND
1,2,3-Trichloropropane	0.001	0.005	ND	0.24	0.22	1.16	0.81
Our Lab I.D.			Method Blank	42893.02	42893.03	42893.04	42893.05
Surrogates	%Rec.Limit		% Rec.	% Rec.	% Rec.	% Rec.	% Rec.
Toluene-d8	80-120		96.6	96.2	98.8	94.0	96.2



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Project ID: 20114-01

Project Name: PAC WELLS

AETL Job Number	Submitted	Client
42893	06/26/2007	T/T

Method: 8260B-SIM, 1,2,3-TCP and 1,4-Dioxane by GC/MS SIM (8260B Modified)

QC Batch No: 062707

Our Lab I.D.			42893.06				
Client Sample I.D.			MW-3				
Date Sampled			06/26/2007				
Date Prepared			06/27/2007				
Preparation Method			5030B				
Date Analyzed			06/27/2007				
Matrix			Aqueous				
Units			ug/L				
Dilution Factor			1				
Analytes	MDL	PQL	Results				
1,4-Dioxane	0.50	2.00	ND				
1,2,3-Trichloropropane	0.001	0.005	1.86				
Our Lab I.D.			42893.06				
Surrogates	%Rec.Limit		% Rec.				
Toluene-d8	80-120		97.0				



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Project ID: 20114-01

Project Name: PAC WELLS

AETL Job Number	Submitted	Client
42893	06/26/2007	T/T

Analytes			Chromium (VI)	Nitrate as Nitrogen	Chromium (Total)	Thallium
Methods of Analyses			218.6	300.0	6010BSCAN	6010BSCAN
Date Prepared			06/27/2007	06/27/2007	07/03/2007	07/03/2007
Date Analyzed			06/27/2007	06/27/2007	07/03/2007	07/03/2007
Matrix			Aqueous	Aqueous	Aqueous	Aqueous
QC Batch Number			062707	062707	070307	070307
Units			ug/L	mg/L	mg/L	mg/L
Method Detection Limit			0.10	0.20	0.001	0.001
Practical Quantitation Limit			0.20	1.00	0.005	0.005
Dilution Factor			1	1	1	1
Lab ID	Sample ID	Sampled	Results	Results	Results	Results
42893.02	MW-8	06/26/2007	ND	14.0	0.002J	ND
42893.03	MW-9	06/26/2007	ND	14.0	ND	0.017
42893.04	MW-5	06/26/2007	2.26	15.4	0.003J	0.006
42893.05	MW-6	06/26/2007	2.28	14.1	0.003J	0.015
42893.06	MW-3	06/26/2007	ND	16.1	ND	0.016
N/A	Method Blank	//	ND	ND	ND	ND



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Project ID: 20114-01

Project Name: PAC WELLS

AETL Job Number	Submitted	Client
42893	06/26/2007	T/T

Method: 218.6, Chromium hexavalent by Ion Chromatography

QUALITY CONTROL REPORT

QC Batch No: 062707; Dup or Spiked Sample: 42893.06; LCS: Clean Water; QC Prepared: 06/27/2007; QC Analyzed: 06/27/2007;

Units: ppb

Analytes	Sample Result	MS Concen	MS Recov	MS % REC	MS DUP Concen	MS DUP Recov	MS DUP % REC	RPD %	MS/MSD % Limit	MS RPD % Limit
Chromium (VI)	0.00	50.00	49.00	98.0	50.00	49.00	98.0	<1	85-115	<20

QC Batch No: 062707; Dup or Spiked Sample: 42893.06; LCS: Clean Water; QC Prepared: 06/27/2007; QC Analyzed: 06/27/2007;

Units: ppb

Analytes	LCS Concen	LCS Recov	LCS % REC	LCS/LCSD % Limit						
Chromium (VI)	50.00	49.00	98.0	80-120						



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Project ID: 20114-01

Project Name: PAC WELLS

AETL Job Number	Submitted	Client
42893	06/26/2007	T/T

Method: 300.0, Determination of Inorganic Anion in water by IC

QUALITY CONTROL REPORT

QC Batch No: 062707; LCS: Clean Water; LCS Prepared: 06/27/2007; LCS Analyzed: 06/27/2007; Units: ppm

Analytes	LCS Concen	LCS Recov	LCS % REC	LCS DUP Concen	LCS DUP Recov	LCS DUP % REC	LCS RPD % REC	LCS/LCSD % Limit	LCS RPD % Limit	
Nitrate as Nitrogen	2.00	1.94	97.0	2.00	1.92	96.0	1.0	80-120	<20	



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Project ID: 20114-01

Project Name: PAC WELLS

AETL Job Number	Submitted	Client
42893	06/26/2007	T/T

Method: 6010BSCAN, Chromium (t) and Thallium by ICP

QUALITY CONTROL REPORT

QC Batch No: 070307; Dup or Spiked Sample: 42893.06; LCS: Clean Water; QC Prepared: 07/03/2007; QC Analyzed: 07/03/2007;

Units: ppm

Analytes	Sample Result	MS Concen	MS Recov	MS % REC	MS DUP Concen	MS DUP Recov	MS DUP % REC	RPD %	MS/MSD % Limit	MS RPD % Limit
Chromium (Total)	0.002	1.00	0.85	85.0	1.00	0.85	85.0	<1	80-120	<15
Thallium	0.016	1.00	0.87	85.0	1.00	0.87	85.0	<1	80-120	<15

QC Batch No: 070307; Dup or Spiked Sample: 42893.06; LCS: Clean Water; QC Prepared: 07/03/2007; QC Analyzed: 07/03/2007;

Units: ppm

Analytes	LCS Concen	LCS Recov	LCS % REC	LCS/LCSD % Limit						
Chromium (Total)	1.00	0.91	91.0	80-120						
Thallium	1.00	0.93	93.0	80-120						



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Telephone: (626)351-4664

Attn: Robert Sabater

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Project ID: 20114-01

Project Name: PAC WELLS

AETL Job Number	Submitted	Client
42893	06/26/2007	T/T

Method: 8260B, Volatile Organic Compounds by GC/MS (SW846)

QUALITY CONTROL REPORT

QC Batch No: 062807; Dup or Spiked Sample: 42893.06; LCS: Clean Water; QC Prepared: 06/28/2007; QC Analyzed: 06/28/2007;

Units: ppb

Analytes	Sample Result	MS Concn	MS Recov	MS % REC	MS DUP Concn	MS DUP Recov	MS DUP % REC	RPD %	MS/MSD % Limit	MS RPD % Limit
Benzene	0.00	50.00	48.00	96.0	50.00	49.00	98.0	2.1	75-125	<20
Chlorobenzene	0.00	50.00	50.50	101	50.00	51.00	102	<1	75-125	<20
1,1-Dichloroethene	12.1	50.00	65.10	106	50.00	62.60	101	4.8	75-125	<20
Methyl-tert-butyl ether (MTBE)	0.00	50.00	49.50	99.0	50.00	49.50	99.0	<1	75-125	<20
Toluene (Methyl benzene)	0.00	50.00	50.00	100	50.00	50.00	100	<1	75-125	<20
Trichloroethene	38.2	50.00	80.20	84.0	50.00	85.70	95.0	12.3	75-125	<20

QC Batch No: 062807; Dup or Spiked Sample: 42893.06; LCS: Clean Water; QC Prepared: 06/28/2007; QC Analyzed: 06/28/2007;

Units: ppb

Analytes	LCS Concn	LCS Recov	LCS % REC	LCS/LCSD % Limit
Benzene	50.00	46.50	93.0	75-125
Chlorobenzene	50.00	49.50	99.0	75-125
1,1-Dichloroethene	50.00	52.50	105	75-125
Methyl-tert-butyl ether (MTBE)	50.00	49.00	98.0	75-125
Toluene (Methyl benzene)	50.00	48.00	96.0	75-125
Trichloroethene	50.00	48.50	97.0	75-125
LCS				
Chloroform (Trichloromethane)	50.00	46.50	93.0	75-125
Ethylbenzene	50.00	50.50	101	75-125
1,1,1-Trichloroethane	50.00	46.00	92.0	75-125
o-Xylene	50.00	52.00	104	75-125
m,p-Xylenes	100.00	104.00	104	75-125



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Attn: Robert Sabater

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Project ID: 20114-01

Project Name: PAC WELLS

AETL Job Number	Submitted	Client
42893	06/26/2007	T/T

Method: 8260B-SIM, 1,2,3-TCP and 1,4-Dioxane by GC/MS SIM (8260B Modified)

QUALITY CONTROL REPORT

QC Batch No: 062707; LCS: Clean Water; LCS Prepared: 06/27/2007; LCS Analyzed: 06/27/2007; Units: ppb

Analytes	LCS Concen	LCS Recov	LCS % REC	LCS DUP Concen	LCS DUP Recov	LCS DUP % REC	LCS RPD % REC	LCS/LCSD % Limit	LCS RPD % Limit	
1,4-Dioxane	25.00	24.40	97.6	25.00	23.90	95.6	2.1	60-130	<30	
1,2,3-Trichloropropane	0.13	0.14	104	0.13	0.12	96.0	8.0	60-130	<30	



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Number of Pages 11

Date Received 06/25/2007

Date Reported 07/25/2007

Job Number	Order Date	Client
42875	06/25/2007	TANK

Project ID: 20114-01
Project Name: PAC Wells
Site: PAC Wells
Lockheed Martin Corp.

Enclosed please find results of analyses of 7 water samples which were analyzed as specified on the attached chain of custody. If there are any questions, please do not hesitate to call.

Checked By: _____

Approved By: _____

C. Razmara

Cyrus Razmara, Ph.D.
Laboratory Director

TETRA TECH

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Phone: 800-288-2385
Dr. Cyrus or Jim Lin

CHAIN OF CUSTODY RECORD

Date: 6-25-07 PAGE 1 OF 2

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Page: 2

Project ID: 20114-01
Project Name: PAC Wells

AETL Job Number	Submitted	Client
42875	06/25/2007	TANK

Method: 8260B, Volatile Organic Compounds by GC/MS (SW846)

QC Batch No: 062707

Our Lab I.D.			Method Blank	42875.01	42875.02	42875.03
Client Sample I.D.				MW-7	MW-4	MW-7 DUP
Date Sampled				06/25/2007	06/25/2007	06/25/2007
Date Prepared			06/27/2007	06/27/2007	06/27/2007	06/27/2007
Preparation Method			5030B	5030B	5030B	5030B
Date Analyzed			06/27/2007	06/27/2007	06/27/2007	06/27/2007
Matrix			Aqueous	Aqueous	Aqueous	Aqueous
Units			ug/L	ug/L	ug/L	ug/L
Dilution Factor			1	1	1	1
Analytes	MDL	PQL	Results	Results	Results	Results
Acetone	10.0	25.0	ND	ND	ND	ND
Benzene	0.20	0.50	ND	ND	ND	ND
Bromobenzene (Phenyl bromide)	0.50	1.00	ND	ND	ND	ND
Bromochloromethane	0.50	1.00	ND	ND	ND	ND
Bromodichloromethane	0.50	1.00	ND	ND	ND	ND
Bromoform (Tribromomethane)	0.50	1.00	ND	ND	ND	ND
Bromomethane (Methyl bromide)	1.50	3.00	ND	ND	ND	ND
2-Butanone (MEK)	2.50	5.00	ND	ND	ND	ND
n-Butylbenzene	0.50	1.00	ND	ND	ND	ND
sec-Butylbenzene	0.50	1.00	ND	ND	ND	ND
tert-Butylbenzene	0.50	1.00	ND	ND	ND	ND
Carbon Disulfide	0.50	5.00	ND	ND	ND	ND
Carbon tetrachloride	0.20	0.50	ND	ND	ND	ND
Chlorobenzene	0.50	1.00	ND	ND	ND	ND
Chloroethane	0.50	1.00	ND	ND	ND	ND
2-Chloroethyl vinyl ether	2.50	5.00	ND	ND	ND	ND
Chloroform (Trichloromethane)	0.50	1.00	ND	0.69J	ND	0.73J
Chloromethane (Methyl chloride)	1.50	5.00	ND	ND	ND	ND
2-Chlorotoluene	0.50	1.00	ND	ND	ND	ND
4-Chlorotoluene	0.50	1.00	ND	ND	ND	ND
1,2-Dibromo-3-chloropropane (DBCP)	2.50	5.00	ND	ND	ND	ND
Dibromochloromethane	0.50	1.00	ND	ND	ND	ND
1,2-Dibromoethane (EDB)	0.50	1.00	ND	ND	ND	ND
Dibromomethane	0.50	1.00	ND	ND	ND	ND
1,2-Dichlorobenzene	0.50	1.00	ND	ND	ND	ND
1,3-Dichlorobenzene	0.50	1.00	ND	ND	ND	ND
1,4-Dichlorobenzene	0.50	1.00	ND	ND	ND	ND
Dichlorodifluoromethane	0.50	1.00	ND	ND	ND	ND



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ANALYTICAL RESULTS

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Project ID: 20114-01
Project Name: PAC Wells

AETL Job Number	Submitted	Client
42875	06/25/2007	TANK

Method: 8260B, Volatile Organic Compounds by GC/MS (SW846)

QC Batch No: 062707

Our Lab I.D.		Method Blank	42875.01	42875.02	42875.03	
Client Sample I.D.			MW-7	MW-4	MW-7 DUP	
Date Sampled			06/25/2007	06/25/2007	06/25/2007	
Date Prepared		06/27/2007	06/27/2007	06/27/2007	06/27/2007	
Preparation Method		5030B	5030B	5030B	5030B	
Date Analyzed		06/27/2007	06/27/2007	06/27/2007	06/27/2007	
Matrix		Aqueous	Aqueous	Aqueous	Aqueous	
Units		ug/L	ug/L	ug/L	ug/L	
Dilution Factor		1	1	1	1	
Analytes	MDL	PQL	Results	Results	Results	Results
1,1-Dichloroethane	0.50	1.00	ND	ND	ND	ND
1,2-Dichloroethane (EDC)	0.50	1.00	ND	ND	ND	ND
1,1-Dichloroethene	0.50	1.00	ND	ND	1.92	ND
cis-1,2-Dichloroethene	0.50	1.00	ND	ND	ND	ND
trans-1,2-Dichloroethene	0.50	1.00	ND	ND	ND	ND
1,2-Dichloropropane	0.50	1.00	ND	ND	ND	ND
1,3-Dichloropropane	0.50	1.00	ND	ND	ND	ND
2,2-Dichloropropane	0.50	1.00	ND	ND	ND	ND
1,1-Dichloropropene	0.50	1.00	ND	ND	ND	ND
cis-1,3-Dichloropropene	0.20	0.50	ND	ND	ND	ND
trans-1,3-Dichloropropene	0.20	0.50	ND	ND	ND	ND
Ethylbenzene	0.50	1.00	ND	ND	ND	ND
Hexachlorobutadiene	1.50	3.00	ND	ND	ND	ND
2-Hexanone	2.50	5.00	ND	ND	ND	ND
Isopropylbenzene	0.50	1.00	ND	ND	ND	ND
p-Isopropyltoluene	0.50	1.00	ND	ND	ND	ND
4-Methyl-2-pentanone (MIBK)	2.50	5.00	ND	ND	ND	ND
Methyl-tert-butyl ether (MTBE)	0.50	1.00	ND	ND	ND	ND
Methylene chloride (DCM)	2.00	4.00	ND	ND	ND	ND
Naphthalene	0.50	1.00	ND	ND	ND	ND
n-Propylbenzene	0.50	1.00	ND	ND	ND	ND
Styrene	0.50	1.00	ND	ND	ND	ND
1,1,1,2-Tetrachloroethane	0.50	1.00	ND	ND	ND	ND
1,1,2,2-Tetrachloroethane	0.50	1.00	ND	ND	ND	ND
Tetrachloroethene	0.50	1.00	ND	51.7	66.5	50.1
Toluene (Methyl benzene)	0.50	1.00	ND	ND	ND	ND
1,1,2-Trichloro-1,2,2-trifluoroethane	1.00	5.00	ND	ND	ND	ND
1,2,3-Trichlorobenzene	0.50	1.00	ND	ND	ND	ND
1,2,4-Trichlorobenzene	0.50	1.00	ND	ND	ND	ND
1,1,1-Trichloroethane	0.50	1.00	ND	ND	ND	ND
1,1,2-Trichloroethane	0.50	1.00	ND	ND	ND	ND
Trichloroethene	0.50	1.00	ND	10.0	14.8	9.74
Trichlorofluoromethane	0.50	1.00	ND	ND	ND	ND
1,2,3-Trichloropropane	0.50	1.00	ND	ND	ND	ND



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ANALYTICAL RESULTS

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Project ID: 20114-01
Project Name: PAC Wells

AETL Job Number	Submitted	Client
42875	06/25/2007	TANK

Method: 8260B, Volatile Organic Compounds by GC/MS (SW846)

QC Batch No: 062707

Our Lab I.D.			Method Blank	42875.01	42875.02	42875.03	
Client Sample I.D.				MW-7	MW-4	MW-7 DUP	
Date Sampled				06/25/2007	06/25/2007	06/25/2007	
Date Prepared			06/27/2007	06/27/2007	06/27/2007	06/27/2007	
Preparation Method			5030B	5030B	5030B	5030B	
Date Analyzed			06/27/2007	06/27/2007	06/27/2007	06/27/2007	
Matrix			Aqueous	Aqueous	Aqueous	Aqueous	
Units			ug/L	ug/L	ug/L	ug/L	
Dilution Factor			1	1	1	1	
Analytes	MDL	PQL	Results	Results	Results	Results	
1,2,4-Trimethylbenzene	0.50	1.00	ND	ND	ND	ND	
1,3,5-Trimethylbenzene	0.50	1.00	ND	ND	ND	ND	
Vinyl Acetate	0.50	5.00	ND	ND	ND	ND	
Vinyl chloride (Chloroethene)	0.20	0.50	ND	ND	ND	ND	
o-Xylene	0.50	1.00	ND	ND	ND	ND	
m,p-Xylenes	0.50	1.00	ND	ND	ND	ND	
Our Lab I.D.			Method Blank	42875.01	42875.02	42875.03	
Surrogates	%Rec.Limit		% Rec.	% Rec.	% Rec.	% Rec.	
Bromofluorobenzene	75-125		112	106	114	105	
Dibromofluoromethane	75-125		94.0	93.0	95.0	99.0	
Toluene-d8	75-125		108	106	107	105	



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Page: 5

Project ID: 20114-01

Project Name: PAC Wells

AETL Job Number	Submitted	Client
42875	06/25/2007	TANK

Method: 8260B-SIM, 1,2,3-TCP and 1,4-Dioxane by GC/MS SIM (8260B Modified)

QC Batch No: 062707

Our Lab I.D.			Method Blank	42875.01	42875.02		
Client Sample I.D.				MW-7	MW-4		
Date Sampled				06/25/2007	06/25/2007		
Date Prepared			06/27/2007	06/27/2007	06/27/2007		
Preparation Method			5030B	5030B	5030B		
Date Analyzed			06/27/2007	06/27/2007	06/27/2007		
Matrix			Aqueous	Aqueous	Aqueous		
Units			ug/L	ug/L	ug/L		
Dilution Factor			1	1	1		
Analytes	MDL	PQL	Results	Results	Results		
1,4-Dioxane	0.05	2.00	ND	ND	ND		
1,2,3-Trichloropropane	0.001	0.005	ND	0.17	0.15		
Our Lab I.D.			Method Blank	42875.01	42875.02		
Surrogates	%Rec.Limit		% Rec.	% Rec.	% Rec.		
Toluene-d8	80-120		96.6	94.0	94.6		



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Project ID: 20114-01

Project Name: PAC Wells

AETL Job Number	Submitted	Client
42875	06/25/2007	TANK

Analytes			Chromium (VI)	Nitrate as Nitrogen	Chromium (Total)	Thallium
Methods of Analyses			218.6	300.0	6010BSCAN	6010BSCAN
Date Prepared			06/26/2007	06/26/2007	06/29/2007	06/29/2007
Date Analyzed			06/26/2007	06/26/2007	06/29/2007	06/29/2007
Matrix			Aqueous	Aqueous	Aqueous	Aqueous
QC Batch Number			062607	062607	062907	062907
Units			ug/L	mg/L	mg/L	mg/L
Method Detection Limit			0.10	0.20	0.001	0.001
Practical Quantitation Limit			0.20	1.00	0.005	0.005
Dilution Factor			1	1	1	1
Lab ID	Sample ID	Sampled	Results	Results	Results	Results
42875.01	MW-7	06/25/2007	ND	13.1	ND	ND
42875.02	MW-4	06/25/2007	ND	14.1	ND	ND
N/A	Method Blank	/ /	ND	ND	ND	ND



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Project ID: 20114-01

Project Name: PAC Wells

AETL Job Number	Submitted	Client
42875	06/25/2007	TANK

Method: 218.6, Chromium hexavalent by Ion Chromatography

QC Batch No: 062607; Dup or Spiked Sample: 42875.02; LCS: Clean Water; QC Prepared: 06/26/2007; QC Analyzed: 06/26/2007;

Units: ppb

Analytes	Sample Result	MS Concn	MS Recov	MS % REC	MS DUP Concn	MS DUP Recov	MS DUP % REC	RPD %	MS/MSD % Limit	MS RPD % Limit
Chromium (VI)	0.00	50.00	47.00	94.0	50.00	47.00	94.0	<1	85-115	<20

QC Batch No: 062607; Dup or Spiked Sample: 42875.02; LCS: Clean Water; QC Prepared: 06/26/2007; QC Analyzed: 06/26/2007;

Units: ppb

Analytes	LCS Concn	LCS Recov	LCS % REC	LCS/LCSD % Limit						
Chromium (VI)	50.00	48.50	97.0	80-120						



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Page: 8

Project ID: 20114-01

Project Name: PAC Wells

AETL Job Number	Submitted	Client
42875	06/25/2007	TANK

Method: 300.0, Determination of Inorganic Anion in water by IC

QC Batch No: 062607; LCS: Clean Water; LCS Prepared: 06/26/2007; LCS Analyzed: 06/26/2007; Units: ppm

Analytes	LCS Concen	LCS Recov	LCS % REC	LCS DUP Concen	LCS DUP Recov	LCS DUP % REC	LCS RPD % REC	LCS/LCSD % Limit	LCS RPD % Limit	
Nitrate as Nitrogen	2.00	2.00	100	2.00	2.00	100	<1	80-120	<20	



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Project ID: 20114-01

Project Name: PAC Wells

AETL Job Number	Submitted	Client
42875	06/25/2007	TANK

Method: 6010BSCAN, Chromium (t) and Thallium by ICP

QC Batch No: 062907; Dup or Spiked Sample: 42875.02; LCS: Clean Water; QC Prepared: 06/29/2007; QC Analyzed: 06/29/2007;

Units: ppm

Analytes	Sample Result	MS Concn	MS Recov	MS % REC	MS DUP Concn	MS DUP Recov	MS DUP % REC	RPD %	MS/MSD % Limit	MS RPD % Limit
Chromium (Total)	0.000	1.00	0.95	95.0	1.00	0.95	95.0	<1	80-120	<15
Thallium	0.000	1.00	0.96	96.0	1.00	0.99	99.0	3.1	80-120	<15

QC Batch No: 062907; Dup or Spiked Sample: 42875.02; LCS: Clean Water; QC Prepared: 06/29/2007; QC Analyzed: 06/29/2007;

Units: ppm

Analytes	LCS Concn	LCS Recov	LCS % REC	LCS/LCSD % Limit						
Chromium (Total)	1.00	1.03	98.0	80-120						
Thallium	1.00	1.03	103	80-120						



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Project ID: 20114-01

Project Name: PAC Wells

AETL Job Number	Submitted	Client
42875	06/25/2007	TANK

Method: 8260B, Volatile Organic Compounds by GC/MS (SW846)

QC Batch No: 062707; Dup or Spiked Sample: 42875.02; LCS: Clean Water; QC Prepared: 06/27/2007; QC Analyzed: 06/27/2007;

Units: ppb

Analytes	Sample Result	MS Concn	MS Recov	MS % REC	MS DUP Concn	MS DUP Recov	MS DUP % REC	RPD %	MS/MSD % Limit	MS RPD % Limit
Benzene	0.0	50.00	51.00	102	50.00	51.00	102	<1	75-125	<20
Chlorobenzene	0.0	50.00	49.50	99.0	50.00	49.00	98.0	1.0	75-125	<20
1,1-Dichloroethene	0.0	50.00	54.50	108	50.00	53.50	109	<1	75-125	<20
Methyl-tert-butyl ether (MTBE)	0.0	50.00	48.00	96.0	50.00	48.00	96.0	<1	75-125	<20
Toluene (Methyl benzene)	0.0	50.00	50.00	100	50.00	50.00	100	<1	75-125	<20
Trichloroethene	14.8	50.00	58.80	88.0	50.00	59.80	90.0	2.2	75-125	<20

QC Batch No: 062707; Dup or Spiked Sample: 42875.02; LCS: Clean Water; QC Prepared: 06/27/2007; QC Analyzed: 06/27/2007;

Units: ppb

Analytes	LCS Concn	LCS Recov	LCS % REC	LCS/LCSD % Limit						
Benzene	50.00	50.50	101	75-125						
Chlorobenzene	50.00	54.00	108	75-125						
1,1-Dichloroethene	50.00	50.00	100	75-125						
Methyl-tert-butyl ether (MTBE)	50.00	46.50	93.0	75-125						
Toluene (Methyl benzene)	50.00	52.50	105	75-125						
Trichloroethene	50.00	53.50	107	75-125						
LCS:										
Chloroform (Trichloromethane)	50.00	46.00	92.0	75-125						
Ethylbenzene	50.00	55.50	111	75-125						
1,1,1-Trichloroethane	50.00	42.50	85.0	75-125						
o-Xylene	50.00	58.50	117	75-125						
m,p-Xylenes	100.00	121.00	121	75-125						



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Page: 11

Project ID: 20114-01

Project Name: PAC Wells

AETL Job Number	Submitted	Client
42875	06/25/2007	TANK

Method: 8260B-SIM, 1,2,3-TCP and 1,4-Dioxane by GC/MS SIM (8260B Modified)

QC Batch No: 062707; LCS: Clean Water; LCS Prepared: 06/27/2007; LCS Analyzed: 06/27/2007; Units: ppb

Analytes	LCS Concen	LCS Recov	LCS % REC	LCS DUP Concen	LCS DUP Recov	LCS DUP % REC	LCS RPD % REC	LCS/LCSD % Limit	LCS RPD % Limit	
1,4-Dioxane	25.00	24.50	98.0	25.00	24.00	96.0	2.1	60-130	<30	
1,2,3-Trichloropropane	0.13	0.14	104	0.13	0.12	96.0	8.0	60-130	<30	

APPENDIX C

QUALITY ASSURANCE/QUALITY CONTROL SUMMARY

QUALITY ASSURANCE/QUALITY CONTROL SUMMARY

1.0 INTRODUCTION

The Quality Assurance/Quality Control (QA/QC) Summary is the relevant QA/QC information associated with the Burbank Operational Unit sampling data set (PAC Wells Second Quarter 2007). The QA/QC Summary contains the following two subjects, which are addressed in detail:

- Data validation concepts, rationale, and practices; and
- Data quality objectives, evaluation, and implications.

2.0 SELECTED DEFINITIONS/CRITERIA OF TERMS

2.1 HOLDING TIMES

The U. S. Environmental Protection Agency (U.S. EPA) has established maximum time intervals (holding times) between the collection, extraction, and analysis of samples. All compliant results must be obtained within holding times or the results are considered deficient. Samples analyzed outside of holding times must be qualified.

2.2 LABORATORY AND FIELD BLANKS

Laboratory and field blanks are samples used to determine if environmental sample results may be positively biased by laboratory or field contamination. Laboratory blank results indicate contamination due to laboratory operations only, while field blank results indicate contamination from field and/or laboratory operations. Laboratory blanks contaminated above the Practical Quantitation Limit (PQL) indicate a need for corrective action.

2.3 MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD)

Matrix spike samples are environmental samples that are spiked with known concentrations of target analytes. The recovery of the target analytes is used to evaluate the effects of the sample matrix. Matrix effects are considered site specific. One MS/MSD sample is analyzed for every 20 environmental samples or sample day. The matrix spike duplicate results may be compared to the matrix spike results in order to determine precision.

2.4 LABORATORY CONTROL SAMPLE (LCS)

The LCS determines if the analytical system is in control and consists of reagent grade (analyte free) water spiked with known concentrations of target analytes. Results from the LCS are considered free of any matrix effects and analyte recoveries outside control limits are used to qualify data.

2.5 SURROGATES

For most methods, surrogate compounds are added to every sample at the beginning of sample preparation and are used to monitor the analytical process and give information concerning matrix effects. Surrogate recoveries are the single most useful QC entity for evaluating environmental analytical data. The ubiquitous use of surrogates in the analytical methods has afforded a large database of results from which useful correlated information can be extracted. Surrogates are chemically similar to target analytes and their

recovery within control limits indicates the process is in control. Surrogates are the primary indicators of matrix effects.

2.6 SECOND COLUMN CONFIRMATION

All organic analysis that results in analyte detection should be confirmed in order to have confidence in the result. In the case of gas chromatography/mass spectrometry (GC/MS) analysis, analyte peaks at the correct retention time are confirmed by the mass spectra. For GC or high performance liquid chromatography (HPLC) analysis, a second analytical column and/or a second detector is used for to confirm the presence of the analyte. Unless an analyte is confirmed, its presence cannot be proved.

2.7 TEMPERATURE BLANKS

Temperature blanks are placed in coolers with environmental samples in order to determine the temperature of the samples when they arrive at the lab. Temperature blanks typically consist of water in a container similar to the sample containers. Upon receipt at the lab, the temperature blanks are opened and a thermometer is inserted directly into the liquid. Alternatively, the temperature of the samples is measured using an infrared thermometer. The criterion is 4 degrees Celsius, plus or minus 2 degrees. Samples that arrive at the laboratory shortly after sample collection (less than 4 hours) may not have sufficient time for temperature equilibration. In these cases, samples may exceed the upper temperature limit of 6 degrees Celsius, but must be below ambient temperatures.

2.8 FIELD AUDITS

Field audits determine if the sampling procedures used by the field crew are in accordance with standard operating procedures. The techniques used to collect the samples are analyzed to determine if the samples are being collected correctly.

2.9 SAMPLE DELIVERY GROUP (SDG)

The SDG is a laboratory-defined collection of sample results together with the corresponding quality control results. These results are organized under a unique group heading. The laboratory determines the method of grouping the sample results under an SDG and each SDG may contain samples collected at various times and with different matrix types. Generally, each SDG consists of the results for a group of samples received by the laboratory on a single day.

2.10 DATA GAPS

Data gaps may be generated by both field sampling activities and laboratory data problems. Field activities that may produce data gaps include difficulty accessing the sampling location, which results in no sample being collected, or damage and subsequent loss of samples before they reach the laboratory. Laboratory QC errors resulting in data that must be qualified as rejected will also leave data gaps in the analytical results. If necessary, data gaps may be closed quickly by resampling and reanalysis. If the results are not time critical, the gap may be closed during the next quarter of sampling.

2.11 CORRECTIVE ACTIONS

Corrective actions are performed in response to data or conditions that are not in analytical control. Corrective actions are performed in an attempt to bring the error condition back under control. Corrective

actions are documented by a corrective action report (CAR) and are included in the laboratory's SDG data package.

3.0 DATA VALIDATION RATIONALE AND GUIDELINES

3.1 CONTROLLING DOCUMENTS

The following documents were used for data validation.

- USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review (Publication OSWER 9240.1-05A-P, EPA-540/R-99/008, October 1999); and
- USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (Publication OSWER 9240.1-35, EPA-540/R-01/008, July 2002).

These two documents are hereinafter collectively referred to as the National Functional Guidelines.

3.2 DATA VALIDATION THEORY AND MATRIX EFFECTS

The practice of data validation in the environmental organic chemistry field has been the subject of debate for many years. Determining the validity of environmental data results when matrix effects are suspected is not an exact science, and professional judgment concerning matrix effects is used to help guide the data to its best logical interpretation and evaluation.

The overall QC of environmental sample analysis can be divided into two main categories. These categories are generally considered to be "method QC" and "instrument QC." Both types of QC operate independently to validate the data and qualify the results.

Instrument QC parameters are often well defined and well understood and are based on the tangible physical laws of analytical instrumentation. Instrument QC parameters have to do with (but are not limited to) the calibration, chromatography, and detection aspects of environmental data analysis. Instrument QC parameters are considered independent from a sample's matrix and/or matrix effects.

Conversely, method QC parameters do not yield results that are as well defined, since they are based in part on problems associated with the intangible and/or unknown effects of the sample matrix. Method QC parameters have to do with (but are not limited to) the spiking, extraction, and spike recovery aspects of environmental data analysis. Method QC parameters are considered dependent on a sample's matrix and/or matrix effects.

When evaluating environmental data results with pronounced or unknown matrix effects, a conservative approach to the validation is required. The method QC parameters are rigidly applied and validations are conferred to entire data sets based on one sample's bias.

3.3 DATA VALIDATION RATIONALE

The *National Functional Guidelines* were written for use with the Contract Laboratory Program (CLP) methods as outlined in the CLP Statement of Work (SOW). The SOW contains methods for volatile and semivolatile GC/MS analysis, two-column GC pesticide analysis, and inductively coupled plasma (ICP) metal analysis. These methods do not differ significantly in the application of the basic quality control

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parameters from those found in the corresponding SW846 methods for volatile, semivolatile, pesticide, and ICP metals analyses (hereafter referred to as the SW methods). The target compounds in the CLP are a subset of the SW846 target compounds.

Since the CLP methods and the SW846 methods have similar QC instructions, the *National Functional Guidelines* are usable for the SW methods. In order to validate analytical methods that have no corresponding CLP method validation guidance, logical extrapolations are determined by modeling the pertinent CLP rationale. The resulting validated data have a professional judgment component that allows the validation to be tailored to the individual project. Since the validation of environmental results is not an exact science, interpretive judgments are sometimes required for complex data. After several years of sampling the same wells and analyzing the samples by the same methods for the same analytes, the database of historical results is useful for applying professional judgment to data validation. In an effort to give the AFCEE as much usable data as possible, Tetra Tech uses professional judgment when validating the data and uses the *National Functional Guidelines* as the primary guidance documents for validation purposes.

3.4 VALIDATION QUALIFIERS

- B: The sample result is less than 5 times (10 times for common organic laboratory contaminants) the blank contamination. The result is considered not to have originated from the environmental sample, because cross-contamination is suspected.
- J: The analyte was positively identified and the result is usable; however, the analyte concentration is an estimated value.
- R: The sample result is rejected and not usable for any purpose. The presence or absence of the analyte cannot be verified.
- U: The analyte was not detected at or above the reporting detection limit (RDL).
- UJ: The analyte was not detected above the MDL; however, the MDL is uncertain and may be elevated above normal levels.
- Y: Confirmation column results indicate a non-detect for the target analyte.

3.5 QUALIFIER DESCRIPTORS

- a: The analyte was found in the method blank.
- b: The surrogate spike recovery was outside quality control criteria.
- c: The MS and/or MSD recoveries were outside control limits.
- d: The laboratory control sample recovery was outside control limits.
- e: A holding time violation occurred.
- f: The duplicate/replicate sample's relative percent difference (RPD) was outside the control limit.
- g: The data met prescribed criteria as detailed in the QAPP.
- h: The required second column confirmation was not performed.
- k: The analyte was found in a field blank.
- l: The second column confirmation result indicates the analyte was not confirmed.
- n: The laboratory case narrative indicated a QC problem.
- p: Professional judgment determined the data should be qualified.
- q: The analyte detection was below the PQL.
- r: The result is above the instrument's calibration range.
- t: The temperature was outside acceptance criteria.

3.6 LEVEL ONE VALIDATION GUIDELINES

3.6.1 Organic Validation Guidelines

Sample Preservation

- As a rule, all samples are required to be preserved at a temperature of 4 degrees Celsius, plus or minus 2 degrees. Additional preservation criteria are method specific. The temperature criterion applies to all samples.
- Samples placed in a cooler and transported directly to the laboratory with short transit times (less than 4 hours) do not allow for temperature equilibration. The temperature of samples with short transit time must be below ambient temperature with evidence of cooling in progress (ice or ice-substitute present).
- Samples with temperatures in excess of six degrees Celsius but less than or equal to 12 degrees Celsius are qualified J for detected analytes and UJ for non-detects.

- Samples in gross excess (>12 degrees) of the temperature criteria are qualified **J** for detected analytes and non-detects are qualified **R**.
- The descriptor **t** is used to indicate sample temperature qualification.

Holding Times

- For volatile organic analyses (VOA) samples, analysis after 14 days (7 days if not pH preserved) from collection are qualified **J** and **UJ**.
- For semivolatile (SV) samples, water samples extracted after 7 days (14 days for soil) are qualified **J** and **UJ**. Samples analyzed after 40 days from extraction are also qualified **J** and **UJ**.
- If holding times are grossly exceeded (greater than 2 times the normal holding time), then positive results are qualified **J** and non-detects are qualified **R**.
- The descriptor **e** is used to denote holding time violations.

Blanks

- Analytes found in associated environmental samples at or below 5 times (10 times common organic analytes) of the method or field blank analyte concentrations are qualified **B**.
- The descriptor **a** is used to indicate method blank contamination.
- The descriptor **k** is used to indicate field blank contamination.

Surrogates

- For VOA (GC/MS) samples, there are three cases. Any single surrogate failure will cause qualification.
 - Case #1: Recovery above upper limit, then **J** qualify detected analytes. Do not qualify non-detected analytes.
 - Case #2: Recovery between lower limit and 10 percent, then **J** and **UJ**.
 - Case #3: Recovery below 10 percent, then **J** positive results and **R** non-detects.
- For SV (GC/MS) samples, there are four cases. Except for case four, two surrogate failures (within each fraction) will cause fraction specific qualification.
 - Case #1: Recovery above upper limit, then **J** only. No **UJ**.
 - Case #2: Recovery between lower limit and 10 percent, then **J** and **UJ**.

- Case #3: Recovery of one surrogate above upper limit and one surrogate below the lower limit but above 10 percent, then qualify as in case #2.
- Case #4: Any one surrogate below 10 percent, then **J** positive results and **R** non-detects.
- For SV (GC) samples.
 - Case #1: Recovery above upper limit, then **J** only positive results. Non-detects are not qualified.
 - Case #2: Recovery between lower limit and 10 percent, then **J** positive results. Non-detects are qualified **UJ**.
 - Case #3: Recovery below 10 percent, then **J** positive results and **R** non-detects.
- The descriptor **b** is used to indicate surrogate failure qualification.

Laboratory Control Sample

- For laboratory control sample (LCS) qualifications, the specific analytes spiked into the LCS sample must always be qualified. All target analytes are spiked into the LCS.
- For all methods requiring LCS recoveries there are 2 cases.
 - Case #1: LCS recovery is above upper limit, then **J** detected analytes only. Do not qualify non-detects.
 - Case #2: LCS recovery is below lower limit then **J** positive results and **R** non-detects.
- The descriptor **d** is used to indicate LCS qualification.

Matrix Spike/Matrix Spike Duplicates

- The target analytes spiked into the MS/MSD are listed in the project specific QAPP.
- There are two cases for qualification based on the MS/MSD results.
 - Case #1: Non-compliant spike recoveries comprise the first case for qualification based on MS/MSD results. MS and MSD spike recoveries outside of control limits, where the LCS demonstrates that the analytical system was in control, are attributed to the effects of the sample matrix. If both the MS and MSD fail spike recovery criteria as indicated below, qualify based on the least compliant recovery.
 - Recovery above upper limit, then **J** detected compounds only. Do not qualify non-detects.

- Recovery between lower limit and 10 percent, then **J** detected compounds and **UJ** non-detects.
 - Recovery below 10 percent, then **J** detected compounds and **R** non-detects.
 - Case #2: Non-compliance of the RPD value is the second case for qualification of data based on the MS/MSD results. MS/MSD RPDs are calculated from the analyte concentrations of the MS and MSD. If the RPD is outside the control limit, the precision is in question, and the accuracy is compromised.
 - RPD outside the control limit, then qualify the related samples with **J** for detected compounds and **UJ** non-detects.
- The descriptor **c** is used to indicate MS/MSD qualification based on the percent recovery of the spiked analytes.
 - The descriptor **f** is used to indicate RPD failure.

Second Column Confirmation

For certain GC or HPLC methods, second column/detector confirmation is required for detected analytes. Refer to the relevant QAPP for method and analyte specific requirements.

Second column results are used to confirm the actual presence or absence of a target analyte. U.S. EPA guidelines state "If the qualitative criteria for both columns were not met, all target compounds that are reported detected should be considered non-detected." Therefore, any compound detection on only one column is not considered a target compound hit.

- For the situation where a compound was detected on the primary column and not detected on the confirmation column, consider the value reported to be not detected. Qualify the result with **Y** and use the **I** descriptor.
- In the case of a detection on the primary column where the required second column confirmation was not performed, then qualify the result with **R** and use the **h** descriptor.

Field Duplicate Samples

Field duplicate samples are collected to assess the precision of the sample collection and laboratory analytical process. As a rule, both the sample and its duplicate result must be at or above the PQL in order to calculate a meaningful RPD and if both results are below the PQL the RPD is not calculated. However, if one result is below the PQL (assume zero for a non-detect) and the other result significantly above (10 times) the PQL a RPD is calculated. If the RPD is outside the control limit, the precision is in question, and the accuracy is compromised. The qualification resulting from the sample and its duplicate non-compliant RPD apply only to the sample and its duplicate and is analyte specific.

- If the RPD is outside the control limit, then qualify the sample and its duplicate with **J** for detected compounds and **UJ** non-detects.

- The descriptor **f** is used to indicate RPD failure.

3.6.2 Inorganic Validation Guidelines

Sample Preservation

- As a rule, all samples are required to be preserved at a temperature of 4 degrees Celsius, plus or minus 2 degrees. Additional preservation criteria are method-specific. The temperature criterion applies to all samples except ICP metals and mercury in a water matrix, which are exempt from temperature preservation.
- Samples placed in a cooler and transported directly to the laboratory with short transit times (less than 4 hours) do not allow for temperature equilibration. The temperature of samples with short transit time must be below ambient temperature with evidence of cooling in progress (ice or ice-substitute present).
- Samples with temperatures in excess of six degrees Celsius but less than or equal to 12 degrees Celsius are qualified **J** for detected analytes and **UJ** for non-detects.
- Samples in gross excess (more than 12 degrees) of the temperature criteria are qualified **J** for detected analytes and non-detects are qualified **R**.
- The descriptor **t** is used to indicate sample temperature qualification.

Holding Times

- Holding times are measured from the sampling date.
- Holding times for inorganic compounds vary from 24 hours for analyses such as chromium VI and pH to six months for ICP metals. Results produced from analyses performed beyond the holding time are qualified as estimated **J** for detected values and **UJ** for nondetects.
- If holding times are grossly exceeded (greater than 2 times the normal holding time), then positive results are qualified **J** and non-detects are qualified **R**.
- The descriptor **e** is used to denote holding time violations.

Blanks

- Equipment blanks and/or laboratory blanks are evaluated for contaminants.
- Analytes found in associated environmental samples at or below 5 times the blank analyte contamination are qualified **B**.
- Analytes qualified for laboratory blank contamination are denoted with a descriptor **a**.

- Analytes qualified for equipment blank contamination are denoted with a descriptor **k**.

Laboratory Control Sample

- For LCS qualifications, the specific analytes spiked into the LCS sample must always be qualified. All target analytes are spiked into the LCS.
- LCS recovery is above upper limit then **J** detected analytes only. Do not qualify non-detects.
- LCS recovery is below lower limit then **J** positive results and **R** non-detects.
- Analytes qualified for LCS failure are denoted with a descriptor **d**.

Matrix Spike/Matrix Spike Duplicate

The target analytes spiked into the MS/MSD are listed in the project specific QAPP. Each specific MS or MSD spiking analyte that fails recovery criteria produces qualification of the matching analyte in the site associated environmental samples. Where both the MS and MSD fail criteria, qualify based on the least compliant recovery.

- MS/MSD recovery results are not used for qualification if the analyte concentration in the environmental sample used for the MS/MSD exceeds the spike concentration by a factor of 4 or more.
- If the MS and/or MSD recovery exceed the upper control limit, then **J** detected compounds only. Do not qualify non-detected compounds.
- If the MS and/or MSD recovery falls between the lower limit and 10 percent, then **J** detected compounds and **UJ** non-detects.
- If the MS or MSD recovery is less than 10 percent, then **J** detected analytes and **R** non-detected analytes.
- The descriptor **c** is used to indicate MS/MSD qualification based on the percent recovery of the spiked analytes.
- MS/MSD RPDs are calculated from the analyte concentrations of the MS and MSD. If the RPD is outside the control limit, the precision is in question, and the accuracy is compromised.
- MS/MSD RPD results are not used for qualification if the analyte concentration in the environmental sample used for the MS/MSD exceeds the spike concentration by a factor of 4 or more.
- RPD outside the control limit, then qualify the related sample results with **J** for detected compounds and **UJ** non-detects.

- The descriptor **f** is used to indicate RPD failure.

Field Duplicate Samples

Field duplicate samples are collected to assess the precision of the sample collection and laboratory analytical process. As a rule, both the sample and its duplicate result must be at or above the PQL in order to calculate a meaningful RPD and if both results are below the PQL, the RPD is not calculated. However, if one result is below the PQL (assume zero for a non-detect) and the other result significantly above (10 times) the PQL a RPD is calculated. If the RPD is outside the control limit, the precision is in question, and the accuracy is compromised. The qualification resulting from the sample and its duplicate non-compliant RPD apply only to the sample and its duplicate and is analyte specific.

- If the RPD is outside the control limit, then qualify the sample and its duplicate with **J** for detected compounds and **UJ** non-detects.
- The descriptor **f** is used to indicate RPD failure.

4.0 SUMMARY OF DATA QUALITY OBJECTIVES AND COMPLIANCE

4.1 DATA QUALITY OBJECTIVES

Data quality objectives (DQOs) are qualitative and quantitative statements developed by data users to specify the quality of data from field and laboratory data collection activities. These DQOs must be carefully designed to support specific decisions or regulatory actions. The DQOs describe which data are needed, why the data are needed, and how the data will be used to address the problem being investigated. DQOs also establish numeric limits for the data to allow the data user to determine whether the data collected are of sufficient quality for use in their intended application.

The usability of the data collected during this investigation depends on its quality. A number of factors relate to the quality of data, and sample collection methods are as important to consider as methods used for sample analysis. Following standard operating procedures for both sample collection and analysis reduces sampling and analytical error. Complete chain-of-custody documentation and adherence to required sample preservation techniques, holding times and proper shipment methods ensure sample integrity. Obtaining valid and comparable data also requires adequate QA/QC procedures and documentation, as well as established detection and control limits.

Quantitation limits are based on the extent to which the field equipment, laboratory equipment, or analytical process can provide accurate measurements of consistent quality for specific constituents in field samples. The quantitation limit for a given analysis will vary depending on instrument sensitivity and matrix effects.

4.2 PRECISION, ACCURACY, COMPLETENESS, AND COMPARABILITY

The effectiveness of a QA program is measured by the quality of data generated by the laboratory. Data quality is judged in terms of its precision, accuracy, completeness, and comparability. These terms are described as follows:

4.2.1 Accuracy

Accuracy is the degree of agreement of a measurement or average of measurements with an accepted reference or "true" value, and is a measure of bias in the system. The accuracy of a measurement system is impacted by the errors introduced through the sampling process, field contamination, preservation, handling, sample matrix, sample preparation, and analytical techniques.

For this project, laboratory accuracy of the measurement data will be assessed and controlled. Results for blanks, matrix spikes, LCS, and surrogates will be the primary indicators of accuracy. These results will be used to control accuracy by requiring that they meet specified criteria. As spiked samples are analyzed, spike recoveries will be calculated and compared to pre-established acceptance limits.

Acceptance limits are based upon previously established laboratory performance for similar samples. In this approach, the control limits reflect the minimum and maximum recoveries expected for individual measurements for an in-control system. Recoveries outside the established limits indicate some assignable cause, other than normal measurement error, and possible need for corrective action. This includes recalibration of the instrument, reanalysis of the QC sample, reanalysis of the samples in the batch, or flagging the data as suspect if the problems cannot be resolved. For contaminated samples, recovery of matrix spikes may depend on sample homogeneity, matrix interference, and dilution requirements for quantification.

4.2.2 Precision

Precision is a measure of agreement among individual measurements of the same property under prescribed similar conditions. When control limits are established for accuracy, it automatically identifies the precision of the method. In the analysis of samples in a preparation batch, if the recoveries of analytes in the LCS are within the control limits, then the precision is also within limits.

Precision is also determined from duplicate sample analysis and MS/MSD analysis. The precision is quantified by the RPD value calculated from the duplicate results.

4.2.3 Completeness

Completeness is a measure of the amount of valid data obtained from a measurement system compared to the amount expected to be obtained under correct, normal conditions.

Successful analyses are defined as those where the samples arrived at the laboratory intact, properly preserved, in sufficient quantity to perform the requested analyses, and accompanied by a completed chain-of-custody. Furthermore, the sample must be analyzed within the specified holding time and in such a manner that analytical QC criteria described in this document are met.

Factors that adversely affect completeness include:

- Receipt of samples in broken containers;
- Receipt of samples in which chain of custody or sample integrity is compromised in some way;
- Samples received with insufficient volume to perform initial analyses or repeat analyses, if initial efforts do not meet QC acceptance criteria;

- Improperly preserved samples; and
- Samples held in the field or laboratory longer than expected, thereby jeopardizing holding time requirements.

Completeness for the entire project also involves completeness of field and laboratory documentation, whether all samples and analyses specified in the Sampling and Analysis Plan have been processed, and whether the procedures specified in the SAP, Work Plan, and Laboratory Standard Operating Procedures (SOPs) have been implemented.

4.2.4 Comparability

Comparability expresses the confidence with which one data set can be compared to another data set measuring the same property. Comparability is ensured through the use of established and approved sample collection techniques and analytical methods, consistency in the basis of analysis (wet or dry weight, volume, etc.), consistency in reporting units, and analysis of standard reference materials.

4.3 SPECIFIC MEASUREMENT DQOS FOR EVALUATING DATA DQO COMPLIANCE

1. Precision is expressed in RPD values. Spiked (MS/MSD) and unspiked duplicate field samples are analyzed in order to determine precision.
2. Accuracy is expressed as a percentage of the data outside the QC entity's control limits. The percent recoveries from laboratory control sample spikes, matrix spikes and surrogate spikes are used to determine accuracy.

The samples for this data set were examined to determine compliance with the DQOs. The results are listed below.

The following methods analyzed samples for the BOU PAC Wells project and resulted in no QC sample errors and resulted in usable data of known precision and accuracy. The data can be used as stated.

- Method SW8260B Volatile Organic Compounds
- Method SW8260B-SIM for 1,2,3 TCP
- Method SW6010B for dissolved (total) chromium
- Method E218.6 for Hexavalent Chromium
- Method SW8260B M for 1,4-Dioxane
- Method 300.0 for nitrate/nitrite
- Method SW6010B/7000 filtered for thallium

4.4 COMPLETENESS

The completeness of this data set was above the DQO criterion of 90 percent. The DQO was satisfied.

4.5 DATA GAPS

All data are usable for their intended purpose. No data gaps exist.

4.6 HOLDING TIMES COMPLIANCE

All holding times were within criteria

4.7 BLANK CONTAMINATION

None to report.

4.8 OTHER QC PROBLEMS

None to report.